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MINNESOTA MEDICINE

Journal of the Minnesota State Medical Association, Southern Minnesota Medical Association, Northern Minnesota Medical Association, Minnesota Academy of Medicine and Minneapolis Surgical Society.

VOL. XV MAY, 1932 No. 5

COMPULSORY SICKNESS INSURANCE*

JAMES S. GILFILLAN, M.D.
Saint Paul

THE subject of compulsory sickness insurance has for a number of years attracted considerable attention, both in the medical profession and among the laity. Numerous articles on the subject have appeared in our journals and many lay magazines. The presidential address before the American Medical Association, in 1930, by Dr. Morgan, considers the subject quite thoroughly.

In 1917 the "American Association for Labor Legislation" caused to be introduced in legislatures of twenty-two of our states a bill which provided for the compulsory insurance of all employees. The state was to pay all administrative expenses, the balance to be divided equally between the employers and employees and the benefits were as follows:

1. A certain proportion of wages paid during disability.
2. Medical and hospital care, drugs, etc., for insured and family.
3. Expenses of rehabilitation.
4. Dental care.
5. Burial allowance.

These bills all failed to pass.

The great majority of these articles and discussions, however, are controversial in character, the writer or speaker considering the subject from his own point of view.

It appears that the subject is a live one and the medical profession should be informed on the subject. It may be that there is little probability of such a system being adopted in our country in the near future but it is, I think, sure to be proposed and seriously considered at some time. When this time comes the united profession should be ready to combat it if this should be thought wise, but especially to direct the legislation and gain as much influence as possible in the direction of the plan if it becomes inevitable.

In the present paper there is no argument for or against the system, but an attempt is made to show briefly its methods of application and, so far as possible, effect on the economic situation of the medical profession in some of the countries in which it is in operation.

First let us review a few statistics having to do with the general economic conditions as related to the cost of sickness in this country. The following table shows the estimated amount expended for this purpose.

150,000 physicians, at $3,000 per annum	$ 450,000,000
140,000 private duty nurses, at $1,500 per annum	210,000,000
150,000 practical nurses, at $1,000 per annum	150,000,000
100,000 attendants, at $1,000 per annum	100,000,000
50,000 dentists, at $3,000 per annum	150,000,000
7,000 hospitals, with total of 860,000 beds	750,000,000
Druggists, for medicines	700,000,000
25,000 healers, chiropractors, osteopaths, Christian Scientists, etc., at $2,000 per annum	50,000,000
Grand Total	$2,560,000,000

Of this amount about $800,000,000 is not paid directly by the recipients of the service but is contributed by government agencies, charity, etc.

For comparison the following national expenditures are given:

Jewelry	500 Million
Autos and parts	2 Billion
Candy	1 Billion
Perfumes and cosmetics	750 Million
Musical instruments	250 Million
Chewing gum	50 Million
Cigarettes	800 Million
Tobacco and snuff	800 Million
Cigar and cigarette holders	1 Million
Alcoholic beverages (Association Against Prohibition Amendment)	3 Billion

The total cost per individual then is about $21.00 or approximately $100.00 per family.

The average wage earner's family pays about

*President's Address before the Minnesota Academy of Medicine, January 13, 1932.

$60.00 a year, farmers about the same, for medical service. The total income of the United States is about $90,000,000,000.00. Incomes of families in 1927 were classified as follows:

6 per cent of families	over	$2,900.00
90 per cent of families	under	2,000.00
67 per cent of families	under	1,450.00

The following shows the number of those employed in the care of the sick:

	Enumerations	Estimates
Physicians	143,000	.....
Attendants of physicians	.....	24,000
Dentists	67,334	.....
Dental hygienists	.....	1,800
Dentists' assistants	.....	12,000
Dental technicians	.....	10,000
Physiotherapists	500	.....
Osteopaths	7,602	.....
Naturopaths	.....	500
Electrotherapists	.....	300
Chiropractors	.....	15,000
Christian Science practitioners	8,500	.....
Trained nurses	.....	200,000
Practical nurses	151,996	.....
Midwives	.....	55,000
Hospital superintendents (not included above)	2,600	.....
Hospital personnel (not included above)	.....	550,000
Clinic attendants (not included above)	.....	5,000
Optometrists and opticians	18,079	.....
Chiropodists and podiatrists	.....	7,000
Masseurs	.....	3,000
Pharmacists	.....	100,000
Drug clerks and assistant registered pharmacists	.....	84,000
Health department personnel (not included above)	.....	11,500
Clinical laboratory personnel	.....	1,400
Personnel of private health organizations (not included above)	.....	1,000
Totals	399,611	1,081,500
Grand total		1,481,111

In the United States there is one physician to every 753 people, a higher proportion than in any other country.

The proportion in some of the European countries is as follows:

Switzerland	1 to 1,250
Denmark	1 to 1,430
England and Wales	1 to 1,490
Germany	1 to 1,560
France	1 to 1,690
Netherlands	1 to 1,820
Sweden	1 to 2,860

Distribution in the different states varies from one to 1,386 in North Dakota to one to 465 in California. The number of physicians employed full time on a salary basis is estimated to be 11 per cent. There are about 7,000 hospitals with a total of 853,000 beds. More than 50 per cent of these are supported by Government agencies and 25 per cent by non-profiting organizations.

Following the industrial revolution in the latter part of the 18th century and under the laissez faire economic system the condition of the working classes became desperate. The state made no attempt to alleviate their distress, trade unions were forbidden and employers were free to oppress their employees without interference on the part of the government.

About the middle of the 19th century some employers, prompted by their own interest or more humane motives, began to take an interest in the welfare of their employees and organized numerous institutions and funds for their relief. These efforts were unsatisfactory and opposed by the socialists on the ground that through them the laborer became more dependent.

Gradually laborers came to look upon themselves as a class opposed to the employers. More concerted action became possible, pressure could be brought on the authorities and the right to establish associations for mutual protection was obtained. So mutual aid societies and the friendly societies of England were established and spread over the continent, usually connected with trade unions.

This movement, however, remained limited and the organizations were apt to be weak financially, due to small membership, etc.

In time, the power of the labor vote being recognized, the authorities gave such societies a special status and even financial assistance. In consequence of this, societies multiplied and membership increased, but owing to multiplicity of organizations, small means, etc., were never entirely satisfactory.

A plan of compulsory sickness insurance was considered by the French convention in 1794 but never put in practice. Germany, in 1883, instituted the first compulsory sickness insurance system. This was apparently a political subterfuge on the part of Bismarck, directed against the socialist movement and the numerous trade funds which might be used in any disagreement with the State. For this reason it was opposed by the working classes. Since then the following countries have adopted this form of relief:

Austria and Hungary in	1888
Luxemburg	1901
Norway	1909
Serbia	1910
Great Britain	1911
Russia	1911
Roumania	1912
Bulgaria	1918

Portugal	1919
Czechoslovakia	1919
Poland	1920
Greece	1922
Japan	1922
Chile	1924
Lithuania	1925

France has just accepted the plan and Australia, South Africa and Brazil have the matter under consideration.

In the various countries now utilizing the system there are, of course, great differences in the scope, limitations, source of contributions, etc.

In the beginning, insurance was as a rule limited to wage earners in industry and commerce. As a rule it has gradually extended to include other employments, as agriculture, domestic service, home workers and, in some instances, to independent workers of limited means. It now includes the family of the worker in the majority of countries. In some countries the liability to insurance is confined to those whose income is below a certain amount; in others the income is not considered. Where there is a limit it usually applies only to non-manual workers. Thus in Austria, Czechoslovakia, Poland, and Russia there is no limit. The following table shows the limit in some of the countries in which it applies:

Country	Class of worker	Source of income	Maximum rate
Germany	Non-manual	Earned	3,600 marks ($900)
Great Britain and Northern Ireland	Non-manual	Earned	£250 ($1,250)
Hungary	Non-manual	Earned	24,000,000 crowns ($340)
Irish Free State	Non-manual	Earned	£250 ($1,250)
Japan	Non-manual	Earned	1,200 yen ($600)
Lithuania	All	Earned	4,800 litas ($480)
Luxemburg	Non-manual	Earned	10,000 francs
Norway	Non-manual	All	6,000 crowns ($1,600)

Once established, the tendency is to increase the scope of insurance. Beginning with wage earners whose income is below a certain maximum, this maximum is apt to be increased or done away with. The dependents usually are included and the medical care is extended to include hospitalization, specialists, dentists, sanatoria, more costly methods of treatment, etc. Usually special benefits are allowed to women for care before, during and after childbirth with often an addition in case the child is nursed. In addition, efforts are made towards the prevention of disease, especially tuberculosis and venereal diseases. Advice on housing conditions, etc., is often given. Ordinarily there is a cash benefit to partially cover loss of income during the illness. Often an allowance for funeral expenses is made.

When a law providing for compulsory insurance is adopted, some provision must be made for the management and application of the system. It is rare for the state itself to undertake this. At present only Bulgaria has a system in which this is done. Ordinarily the insurance is carried by societies which have been in existence previous to the passage of the act or which are later formed for this purpose. The government, however, must approve of the institution, which must conform to the provisions of the law regarding rates of contribution, benefits, etc. The state usually demands that the society does not do business for a profit, must have a minimum membership and reserve fund, and that the insured have a voice in the management. It must provide an opportunity for all to secure insurance. The societies are as a rule managed by the insured and employers, with, at times, representatives of the state.

The insurance group may be composed of those in the same occupation, as a trade union or all the employees of a business. It may be territorial, including all insured in a district, or it may be a mutual group of any kind. As a consequence there is much duplication of work and an unnecessarily high overhead expense. Some funds operate under more favorable conditions and are able to give extra benefits. Others are apt to be unstable as they are dependent on conditions in a certain trade or single undertaking. Many have too *small* a membership. There is a tendency for the number of funds to diminish through consolidation. At present Germany and Great Britain each have about 8,000 authorized funds.

In Poland, where after the war complete reorganization was necessary, territorial funds were established. Each covers an administrative

district or large city and all insured residents of the district are compelled to join the same society. This is a much simpler plan than is usual and there are less than 200 organizations in the country.

The act which establishes the system specifies the source of the necessary contributions. These may be made by the insured, by the employers, by the state or by two or all of these.

In Russia the employer alone pays; in other countries the insured has to bear part of the expense; in Roumania all. In some of the Swiss cantons the cost is borne by the insured and the state, the employer not participating. Usually the insured and employers contribute about equally.

Individual share in contributions may be uniform, as in Great Britain. Here everyone pays the same, irrespective of risk or earnings. Usually the insured are graded according to their earnings, those receiving higher pay being assessed in proportion. Sometimes the assessment varies with the amount of risk.

The minimum benefit to which the insured is entitled is set by law. When an insurance fund is able, it may grant additional benefits.

The rate of money benefit may be the same for all, as in Great Britain, or may be graded according to the wages of the individual, as in most other countries. It usually amounts to 50 or 75 per cent of the wage, rarely to 100 per cent (*e.g.* Russia). In some instances the rate is greater for married men.

In order to claim benefits the insured must be unable to work on account of sickness. Usually the first three or four days are not covered by the insurance; thus brief illnesses are excluded. The duration of benefits varies in different countries from three months to a year. After this period the individual may be protected by an invalidity insurance, distinct from sickness insurance. If hospital treatment is provided, usually the cash benefit is reduced during the time the insured is in the hospital.

In addition to the cash benefit all countries except the Irish Free State provide medical care for the insured, which ordinarily includes drugs and curative appliances. In many countries hospital treatment is also given.

All laws specify that the medical treatment provided must be given by those legally qualified to attend the sick. Usually the insurance institution selects doctors according to some definite method. Treatment by specialists and dentists may be included or not. As a rule the patient is required to visit the doctor's office at certain hours, except when the nature of the case prevents. Drugs and appliances are provided under the majority of schemes, but every effort is made by the funds to keep down expense by supervision of prescribing. Hospital treatment is not compulsory but is given in many countries. Home nursing is usually not provided.

The organization of medical service is usually entrusted to the insurance organizations, with certain legal restrictions. In Great Britain, however, it is in the hands of the insurance committees, which are public bodies selected by the insured, the local doctors and the authorities. In some of the Baltic States the employer is responsible and in Russia the public health authorities.

There are three main systems of medical selection:

1. Any qualified doctor may apply for inclusion on the list. This application gives him the right to treat insured persons. The patient may choose any doctor on the list. There has been much controversy about this free choice, the medical profession usually favoring it, the societies often wishing to restrict it.

2. The number of doctors is limited according to the number of insured. Here the freedom of choice on the part of the patient is also limited.

3. The fund appoints one or more doctors in a locality, on full or part time, and the insured has no choice.

Doctors claim that a patient has a natural right to choose any doctor he wishes and that the society has no right to prevent this choice. The funds claim that an insured person has not this right, as he does not pay directly for the service, and for reasons of economy and simplicity prefer to do business with as few as possible.

Freedom of choice is also objected to on the ground that many persons will go to the physician who most readily grants disability claims.

Medical practitioners are not compelled to accept insurance patients. The organization of the service depends on contracts with the profession. In some countries the terms of the contract may be defined by law; in others the parties are allowed to come to any agreement they see fit.

At present in most countries the contract is made with a national medical society or some other body representing the doctors. Individual contracts are based on these. The situation of the medical profession usually depends on how well organized it is and how soon it unites on its demands after the institution of the system.

The remuneration of the medical profession is naturally one of the principal grounds of contention between the doctors and the funds or authorities. The method of remuneration varies and there are often several different methods in force in the same country.

1. A doctor may be paid a fixed salary. This is more usual when employed for full time but may be for part time.

2. Payment consists of a certain amount per insured person, irrespective of the amount of work done. The fee is based on the morbidity rate. This is the Panel System of Great Britain.

3. There is a fixed fee for each case of sickness, not depending on its severity or duration.

4. The fee is paid according to attendance. Usually a unit of attendance is chosen and for different services multiples of this unit are allowed. This is the plan usually favored by doctors.

In a few countries (*e.g.* Norway) the doctors do not accept a fee set by the funds. They make their own charge, which is ordinarily governed by a schedule agreed upon by the medical society. If this is greater than the amount allowed by the insurance society the patient is expected to pay the difference. This is not satisfactory to the insured and there are often difficulties in collecting.

It is rather difficult to estimate the effect of insurance on the medical profession. Nearly everywhere there is continual dissension between the doctors and the societies or government, but, so far as I am able to ascertain, in no country in which the system is in force is the profession in favor of giving it up. The complaints are rather directed against certain features of its administration.

The first item of contention is the amount received by the doctor for his services. Although in most, if not all, of the countries, the total income of the profession is greater than it was or would be without insurance, this cause of dissatisfaction is always present and probably never can be removed. Connected with this is the tendency to handle too many patients in a superficial way. Where the capitation fee is in force it is said that patients receive too little attention; where the payment is for work done, too much.

The freedom of the physician is, of course, restricted more or less. He must give notice of absences and provide a substitute and his prescribing is to some extent under supervision. At times there may be an investigation of his cases to determine whether his certification of disability is justified. The dissatisfaction of a patient may bring him before a lay body for trial.

A common complaint is the amount of work necessary on records, certificates, etc. This consumes much time and is usually not paid for aside from the regular fee. It is often said that doctors have become clerks and bookkeepers.

Where there is no free choice of a physician doctors are dissatisfied. Where there is free choice patients are apt to select the physician who is most ready to grant certificates.

Apparently there are many reasons for the dissatisfaction of the medical profession but it is difficult to see how any of them could be done away with entirely.

GERMANY

When compulsory sickness insurance was taken up by Germany there was but little voluntary insurance. The system was adopted without any precedent upon which to base it. The medical profession was not consulted and probably paid but little attention to the new order. Germany was at that time prosperous and doctors were independent. The scheme covered at first less than 10 per cent of the population, these being the poorer people who in any case could pay but little for medical care.

The government authorized the formation of funds. These were managed by the insured and employers, who contributed to their support. A fund might be established by a trade union, a fraternal organization, a factory or a department store. In addition there were territorial funds, each for a certain locality. All who did not belong to any other fund were automatically included in these local societies.

The state supervises and safeguards the funds. It specifies the maximum payment which can be charged and the minimum benefit to the insured.

Beyond this it interferes but little except in case of disputes between the interested parties.

Since the inauguration of the system numerous extensions of scope have been made. At present all industrial employees, regardless of pay, and others employed at a salary of less than 3,600 marks are covered by the plan. The law does not compel inclusion of the families of the members, but most of the funds now cover these also. In addition, voluntary insurance has become common and it has been estimated that at present between 80 and 90 per cent of the population is insured.

The societies are permitted to collect not more than 7.5 per cent of the wages of each worker. Of this two-thirds is paid by the insured and one-third by the employer. Funds are allowed to grant extra benefits if their finances permit. It will be seen that the contribution of the insured person depends on his pay, contrary to the plan in England. To simplify bookkeeping all liable to the contribution are divided into sixteen wage groups, according to their average pay.

The benefits are a cash payment of half the worker's wage. This begins on the third day of illness and continues for twenty-six weeks, and medical care for the same time. This care is quite complete, including hospitalization if necessary, dentistry, specialists, drugs, laboratory, X-ray and physical therapy. Ordinary appliances, as spectacles, trusses, braces, etc., are provided. Maternity and funeral allowances are included.

Recently, on account of the rapidly growing number applying for treatment for trivial complaints, the patient is compelled to obtain a permit at a cost of 50 pfennigs before seeing the doctor and to pay part of the cost of medicine.

Free choice of doctors from among those appointed by the funds is usually allowed. These are required to appoint one doctor for every 1,000 insured, or one to every 1,350 when families are included. The societies are trying to reduce the number of doctors while the medical men wish all to have right of treating insurance patients. A patient may change his doctor every three months, except when an illness which he is treating lasts over the quarter, in which case he must be retained for the duration of that illness. House visits are made only when the patient is unable to come to the office, and office visits must be made at a certain time. A patient may have consultation whenever he wishes.

At first the funds dealt with the doctors as individuals, but later the medical profession, through several organizations, has been able to bargain collectively with the insurance societies. All of the plans of payment for medical services mentioned previously have been tried and in different localities several are in force now. Perhaps the most general is the following: Instead of paying the doctor directly the funds pay to the doctors' union a fixed amount per quarter for each patient consulting a physician for any purpose during that period. Out of this sum the union pays the doctor, according to the work done by him. He is allowed one mark for an office consultation and two for a house visit. A surgeon is allowed 20 marks for an appendectomy, 40 for a stomach resection.

The union examines each doctor's records and if he seems to be charging unnecessary visits he is warned, fined or dismissed.

As insurance is so general, about 80 per cent of the doctors depend on the system for their living; about 15 per cent work for a salary; and only 5 per cent are able to get sufficient private practice to live.

The class of work done is probably not high, although perhaps the majority of the people receive better services than they would without insurance. In order to make a fair living a doctor must see from 50 to 200 patients a day. Some become very popular by granting disability certificates easily. It is said that few examinations are made. The fee is the same, so the less done the more remunerative the work is. The paper work necessary in handling patients adds very much to the work of the doctor and is a constant cause of complaint.

During the fifty years the system has been in force there has been a constant struggle between the doctors and the funds. This has been for the most part on the ground of fees, which have always been considered too low. However, there have been other controversial points, as the free choice of doctors, interference with treatment, limitation of the number of doctors appointed, etc. The plan has never been even approximately satisfactory to the medical profession. In 1923 the doctors refused to accept the schedule of fees offered and the funds established dispensaries with full time physicians in many

places. The profession succeeded in having most of these discontinued.

A young physician has a hard time, as private practice is nearly out of the question and it may be necessary to wait for from three to five years before securing an insurance appointment. It is said that there are several thousand waiting at present.

The administration of the scheme is very complicated and expensive. There are nearly as many lay employees as doctors. The funds are powerful financially and politically. There are 70,000 secretaries of funds and Dr. Liek, in his book on social insurance, says that they are the masters of Germany's destiny.

The funds have in many places built fine office buildings, sanatoria, etc. The doctors complain that much of the money so used should be applied to the payment of better fees.

As in most countries, so here, the number of cases applying for benefits and the average duration of the case have been steadily increasing, this being probably due to the hard times. Efforts are being made to control this. The permit charge of 50 pfennigs was made for this purpose and has had some effect, but is objectionable as it often causes delay in calling a doctor when necessary. Late cases of appendicitis are common, perhaps as a consequence.

Control physicians are used to check up on claimants. In Braunschweig 2,008 patients were ordered to report for check-up. Of these, 816 reported for work at once and 289 were found fit for work by the control doctors.

It may be said that the scheme as applied is unsatisfactory to the medical profession and is perhaps not much better for the patients. The increase in irregular practitioners, who in some localities are said to make up 25 per cent of those treating the sick, has been attributed to the dissatisfaction of the workers with the services under insurance.

A reorganization of the whole system is at present under consideration. This contemplates centralizing the administration, raising the wage limit, extension to include classes of workers not insured at present and to have all claimants under the observation of control physicians. In spite of the unsatisfactory condition it is doubtful if many in or out of the medical profession would consider abolishing it.

ENGLAND

In England, before the passage of the National Insurance Act in 1911, voluntary sickness insurance was common among the working classes. In 1904, 5,700,000 were covered by the friendly societies.

These societies have certain advantages over those under a compulsory scheme, in that the members feel some interest in one another and some loyalty to the organization. It was usually a point of honor not to apply for help more than was necessary. Morbidity statistics taken from voluntary society experience have always resulted in a deficit when applied in compulsory insurance. Membership of these clubs was usually from the more thrifty workers, those most apt to become public charges ordinarily not joining.

Doctors contracted for the care of members on a per capita basis, usually 3 to 4 s. annually. A doctor might start a club of his own on the same basis. The pay was inadequate, the services not of a high order and there was much dissatisfaction among the members of the profession.

The National Insurance Act of 1911 covered sickness and unemployment. The Act is said to have been "hastily prepared, imperfectly considered and inadequately discussed." The methods of politics rather than those of science were employed. There were powerful corporations whose compliance was necessary for the passage of the act and these had to be placated by being given control of its administration. The doctors saw the danger but were susceptible to financial promises and too often the rate of payment stood before efficiency of service. Lloyd George originally intended the treatment of the insured by salaried physicians.

It would be interesting to describe in detail the fight put up by the British Medical Association in the interest of the profession when the act was under consideration. Lloyd George did not consult with the medical profession until he and the insurance companies had laid down the main lines of the scheme. For some years before this time the British Medical Association had been engaged in a campaign to secure better conditions under the voluntary plan, but not much progress had been made when the Act was passed. The association had no precedents to guide them and no experience in fighting the government. In spite of this they waged a fierce

and, to an extent, successful battle, which by the way cost them a large sum of money.

The demands of the medical profession were summed up in what were known as the Cardinal Points, as follows:

1. The income limit for compulsory insurance was to be £2 per week.
2. There must be free choice of doctors.
3. The medical benefits were to be administered by local insurance committees, not by the funds.
4. The method of remuneration of physicians adopted by the committee must be that preferred by the majority of doctors in the district.
5. The remuneration must be considered adequate.
6. There must be adequate medical representation on the various bodies administering the insurance.

As to their success in the fight, it may be said that they did well but might have done better. Returning to the Points.

As to Point 1, the income limit, they failed. The objection on the part of the government was the difficulty in administering the plan. Among wage earners pay and employment vary and many would be in and out repeatedly.

Points 2, 3 and 4 were gained.

Point 5. The remuneration has always been considered inadequate by the doctors. This would probably be so in any case.

Point 6. The profession has never considered their representation altogether adequate.

The Act, passed in 1911, went into force in 1913. Up to the last the profession refused offers made them. Then a "rot" set in—some doctors were suspicious of others, fearing the work might go to others; there was a good deal of purely political feeling and fear of opposing the government. At the last minute the authorities announced that 10,000 physicians had offered their services and the fight was over.

In addition to their partial success on their Points, some substantial advantages were gained. The fight of the association and the sympathy aroused in and outside of parliament have made it impossible for the government in the future to act in any similar matter without consultation with the British Medical Association. It never since has denied the right of the doctors to consideration. The Insurance Acts Committee of the Association now meets with representatives of the Ministry on the framing or alteration of any regulations. While they do not always succeed in obtaining what they desire, a fairly satisfactory compromise is usually reached.

The Act applies to all persons between 16 and 65 years of age who are employed in manual labor and to all other employed persons whose remuneration is not over £250 a year. After 65 the old age pension is effective. Many are not included because not employed for wages.

These provisions bring under the plan about 15,000,000 persons or about 35 per cent of the total population, 78 per cent of the occupied, 86 per cent of the employed population.

The state contributes two-ninths of the cost of insurance; the balance is divided equally between the insured and employers. This amounts to 4½ d. a week for each.

The administration of the plan is in the hands of the Ministry of Health, the approved Societies and the Insurance Committees. The approved societies are those which previous to the Act had been writing voluntary insurance and many new ones since organized. The insured are supposed to have a voice in the management but often this is quite vague, as that of a small stockholder in a large corporation. The Societies, as usual, have great financial and political power.

The Act created about 200 Insurance Committees in England, Scotland and Wales. These are made up of representatives of the local council, insured persons, Ministry of Health and panel doctors. There is a committee for each county or county borough in the country. The committees were demanded by the medical profession to escape control by the societies. This committee keeps lists of doctors and druggists who have agreed to undertake insurance work, and also lists of insured arranged as to membership in a society and as to the doctor selected by them. It furnishes each doctor with a list of patients who have selected him. It also oversees the prescribing and the accounts of pharmacists.

Under the Insurance Committee are sub-committees to consider complaints of patients or doctors and matters of a professional character, such as over-prescribing. There is an allocation committee to see that all insured have a doctor, in case they have made no choice or a doctor dies.

The amount collected from the insured in the whole country is pooled and distributed by the

Ministry of Health to the Committee of each district according to the number of insured in each district. The amount assigned divided by the number of insured sets the capitation fee received by the doctors. This varies somewhat but recently has been 9 s. per annum.

In England all insured pay the same amount and are entitled to the same benefit, except a slight difference between men and women. A society may grant additional benefits and this is often done.

The legal benefits are: A cash payment of 15 s. a week for men and 12 s. for women while disabled by sickness, beginning on the fourth day and continuing for twenty-six weeks, after which a disablement allowance of 7 s. 6 d. a week is allowed until recovery or until entitled to old age pension. A maternity benefit of £2 for an insured woman or the wife of an insured man is allowed.

Medical treatment to the insured only.—This treatment is such as a general practitioner is able to give. The services of specialists are not included. In case of doubt as to whether a certain treatment is such as can be expected, the case may be referred to the medical committee. Numerous decisions and rulings already exist. For example, curetting the uterus and setting a fracture of the leg are obligatory; intravenous injections and general anesthetic for tonsillectomy are not.

Obstetrical care and treatment for ten days after labor is not included.

There are no provisions for consultations, laboratory or X-ray work, for nursing, hospital treatment, etc. Drugs are provided.

Every registered physician has a right to have his name placed on the list of insurance doctors. His success depends on his ability to secure patients.

Over two-thirds of the doctors and five-sixths of general practitioners in England are engaged in insurance practice. The average number of patients per doctor is 1,000. No doctor may have more than 2,500 on his list. Under the present capitation fee each doctor receives 9 s. per annum for each insured person on his list, whether sick or well. In addition to the regular fee mileage is allowed for any distance over two miles. The average panel of 1,000 gives a gross income of £450 or $2,250.00. It is estimated that as a rule the doctor receives about as much for treating members of the insured's family. A doctor may sell his list to any registered physician, usually receiving from 9 to 13 s. per capita. A list of 1,000 persons means on the average, for 300 days a year, ten office visits and four house calls.

The insured person has free choice of doctor among those listed. At first he could not change doctors without considerable delay. This rule was given up on the demand of the medical profession but has recently been put into effect again in an attempt to curb the increasing claims of disability. At present a change can be made only at the end of a quarter and with a month's notice.

The income of the profession has been considerably increased by the system. It is said that doctors not in insurance work have been able to increase fees because of the general increase in income.

The work of the doctor has been much increased. Records must be kept, reports made and certificates issued. The doctors complain of this, and it possibly might be simplified, but much of this work is necessary under any such scheme.

In regard to certification of disability the position of the doctor is a difficult one. In England, as everywhere, claims have been increasing rapidly. This increase was in the six years to 1927 from 60 to 100 per cent. This seems to be due largely to a change in the attitude, a lowered morale among the insured. It seems that they are out for all they can get. When impediments to a change of doctor were removed a powerful weapon was put into the hands of the insured. A doctor who refused to issue certificates, when asked, lost his patients. It is said that 99 per cent of changes of doctor were because of refusal to certify disability rather than dissatisfaction with treatment.

The Ministry of Health appoints Regional Medical Officers who examine cases referred by an approved society or panel physician. In 1927 of 210,000 referred for examination nearly one-half failed to appear and only 50,000 were found incapable of work.

The amount allowed for medicines is limited. If any doctor's prescriptions exceed the average they are investigated by a committee and if found more expensive than necessary the excess may be deducted from his pay. There is a tendency to over-prescribe, as the patients demand

medicine. The amount paid for drugs is about one-third of that paid doctors.

On account of the increased claims the Ministry has warned the societies that they might have to reduce benefits. They are urged to investigate in order to determine whether certificates should be accepted. Doctors have been warned to exercise more care in granting certificates.

Recently it has been proposed to reduce the capitation fee by 10 per cent. So far the doctors have refused to accept this.

On the whole the system has been fairly satisfactory. In 1922 the British Medical Association passed a resolution stating that it was sufficiently successful to warrant continuance. There is still considerable opposition on the part of members of the profession but the majority favor it. According to the Association large numbers received medical service who formerly were without it, the treatment is better than under the old clubs and is applied for earlier. There is some interest taken in prevention, clinical records are being accumulated which may be of value and there is more coöperation and feeling of responsibility among physicians. There is still much superficial work done.

There is need for more extensive service, especially the inclusion of hospital care, specialists, laboratory work and nursing. At present from 50 to 60 per cent of patients applying for treatment in free dispensaries are insured persons, showing that they are not entirely satisfied with the service. This may be partly due to the lack of specialists.

Among the changes in the system which have been recently proposed is the inclusion of the families of the insured in the plan. Probably this would decrease the income of the doctor as the pay would be apt to be less than he receives treating them as private patients. Reduction of the number of patients on a doctor's list also has been considered. To this the doctors would agree providing the capitation fee were raised. A raise in the income limit has also been suggested, and the companies would like to employ salaried physicians. This is strenuously objected to by the profession.

NORWAY

Here the application of the system differs in several particulars from that in Germany and England. Here insurance was established in 1911. It covers the family of the insured. Manual workers are all insured. Non-manual wage earners were included if their annual salary was below 6,000 kronen, but this limit has recently been lowered to 5,200 kronen. This lowering of the salary limit is unusual, the tendency being to raise it.

The number of insurance organizations is limited and only one may do business in a locality.

The insured is allowed a certain amount for medical services, for instance in Oslo, 3.50 kronen for an office consultation and 5 kronen for a house visit. The doctor, however, charges what he sees fit for his service and the patient must pay the difference. In some localities the doctors have agreed with the insurance institution not to exceed a certain charge. This method of payment is liked by the medical profession, is fairly satisfactory to the societies, but the patients usually object to paying more than is covered by the insurance. The doctors here as elsewhere complain about the amount of clerical work, certificates, etc., for which they receive no pay.

An unusual provision is that the patient has to pay for medicines and appliances.

Contrasted with the English system, here the tendency is for the patient to receive too much attention; in England too little. In England the doctor may give a patient all the attention a patient needs without being suspected of mercenary motives but also is apt to neglect him. When the patient has to pay for drugs he is more apt to be satisfied with advice instead of the customary bottle of medicine.

In Norway the system is perhaps more satisfactory to the profession than in other countries. It is to be remembered that here there is one doctor to about every 1,800 people.

FRANCE

In France compulsory insurance is just being put into effect. The law is said to be a bad one and some think that it will be impossible to apply it. It is apparently a disappointment even to the beneficiaries, on account of the complications, formalities and small benefits. The medical profession has refused to accept the tariff proposed, and charge regular fees which are much greater than the amount allowed by the insurance companies. The Minister of Health has threatened to appoint full time salaried doctors to do the work.

DENMARK

It may be of interest to consider briefly the situation in Denmark. Here insurance is not compulsory in a legal sense, but the percentage of insured is about the same as in countries where the compulsory system is in force. In 1928 about 65 per cent of the population over 15 years of age was covered.

The insurance companies are under a certain amount of government control as to assets, minimum benefits, etc. The state subsidizes the companies to a certain extent, giving them much reduced rates in hospitals and other advantages.

In this country when a person receives aid from the public authorities he becomes a citizen of the second class. He is not allowed to vote, cannot be married without consent of the authorities, is not eligible for old age pension and must repay the government if it ever becomes possible.

These penalties apparently exert an indirect compulsion to insurance.

The Danish Medical Association represents the entire profession, makes contracts with the insurance companies and specifies the rate of compensation of the doctors.

Medical care rests with the doctor without control. Physicians are paid on a capitation basis in some localities and in others for services rendered.

The medical profession seems well satisfied under this system.

CO-OPERATION*

C. E. Rudolph, D.D.S.
Minneapolis

IT IS indeed a compliment to be asked to appear before this group, and especially do I think the subject assigned very appropriate at this time. I do not say this because of the knowledge of undue friction between the two professions which we represent, but because of the social and political problems which confront us. I am certain that the practitioners of medicine in this Northern Minnesota Medical Association are fully aware of the present status of Medicine and Dentistry in their relationship to the body politic, but I am not so sure that all of us know the trends of lay thinking regarding our social position and economic responsibility to that body. If you have been following closely the better magazines and many of the daily papers of the day, you must realize that the thinking laity are studying the problem of medical care, and are devising ways and means in many localities for the dispensing of medical care. In many instances this is done under the direction of laymen. In other words, they are questioning our ability and inclination to solve the social problem which they feel now confronts this nation, and which involves us especially. I believe I said the thinking lay people were behind this movement. As evidence of this, I may cite the work of the committee on the Costs of Medical Care headed by the Secretary of the Interior, Dr. Ray Lyman Wilbur. No doubt you are quite familiar with its work to date; if not, each one of you who is in the practice of medicine should make it his business to become so. Much comment on the committee's work has already been in the press and the final conclusions are to be given to the press for public consumption.

If you will stop for a moment and ponder over this you will have perhaps one of two reactions: either you will feel perfectly safe with your phase of the problem as studied and conclusions arrived at by your members of this committee, or you will become indignant and question anybody's right to attempt to regulate your professional and business methods in dispensing that which you have educated yourselves to dispense.

Before any of us get excited let us see how much the government (village to the federal) regulates our daily work as we find it today. First, we probably pay much less than half of the cost of our education. The village, county, city, and state furnishes the rest. Next, the state examines and licenses us to practice. When we begin practice we find many barriers and restrictions set up to guide our daily work, which all

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of us know without mentioning. Next, we find that certain groups have attempted to furnish medical care through their officers or appointed officials, who, in turn, dictate or arbitrate the matter of costs, especially, with our professions. Along with this, we find some insurance companies, aided and abetted by the more or less socialistic elements, delving into the mysteries of medicine and attempting to dictate the medical welfare of the people who make up the middle economic class. We can't forget that each one of us must carry compensation insurance or not employ anyone. Many of us have had our patients' diagnosis made and the fee set for our services by a layman, usually an insurance adjuster, before we even see the patient, so that all we have to do is go to work. I am not saying these things in a spirit of criticism at all, but merely stating facts and the tendencies of the natural processes of evolution in medical economics. You and I, to date, are the progeny or product, if you like, of precariously guided medical forces. All or most of the tendencies have been toward scientific progress, much to our credit, with not too much thought given to the social problems involved, a little to our discredit.

We must recognize that the world is growing up. We have much older relatives, economically and socially speaking, on the other continents than we, and what has happened to them in their evolutionary processes is apt to happen to us. Our Committee on the Costs of Medical Care knows considerable about the processes which have finally socialized medicine in the other countries and our field men are still over there. Practically all of the civilized nations of the world have some form of socialized medical care. How we can sit idly by and smugly reiterate to ourselves that it can't happen here because of our different world economic level, is a mystery yet to be solved.

It has, until lately, been almost an insult to the intelligence of the mass of physicians and dentists of this country to even suggest that anyone was dissatisfied in the least with the medical care so generously dispensed. The statistical material gleaned by your committee should put a different meaning on the whole problem, and it is altogether too bad that each one of us has not the privilege of receiving all this material, digesting it, and then coming to conclusions which might otherwise seem so easily arrived at. At this point I am going to inject a few facts found by this committee on costs, and while I am doing all this talking I would not have you think that I have forgotten what my subject is.

With your indulgence I will spend a few minutes with factual material which may be used as a background for further discussion.

Population Data.—"Americans inhabit a territory of more than 3 million square miles, with an average density of 41 persons per square mile, ranging from 20,000 per square mile in Manhattan to less than 1 per square mile in Nevada. Twelve per cent lives in Metropolitan centers of a million or more, and 44 per cent in rural areas or communities of less than 2,500 persons. Nearly 90 per cent of the population is white and 10 per cent is colored; only 55 per cent is native white of native parentage."

Quite naturally we have not taken into consideration the elements of socialistic tendencies in the white group which represents the remaining 45 per cent. Most of these people have been through the socialistic medical evolution in some country of Europe. Many of them can think only of the benefits which they receive personally without having the least idea of what the effect has been upon the professions. Perhaps some of you don't know that medicine was socialized in Germany as long ago as 1883 by an imperial edict. This was the beginning and other central European countries followed. England's House of Commons passed socialized medical legislation in 1911; France in 1928. The history of these three countries regarding the methods used in passing this legislation is peculiarly interesting.

"Thirty-two per cent of the population in 1920 was under 15 years of age, 9 per cent was 15 to 19, 38 per cent was 20 to 44, and 21 per cent over 44. The age distribution is changing steadily because of decreasing birth rates and decreasing death rates. It has been estimated that, by 1975, 26 per cent of the population will be 50 years of age or over as compared with 16 per cent in 1920 and 9 per cent in 1890. In 1920 there were 104 males per 100 females. Six per cent of the people in the U. S. were illiterate in 1920; the percentages for negroes and foreign-born whites were 23 and 13 respectively. People in the United States must adjust themselves to a wide variety of climates, for temperatures have ranged from a maximum of 119 at Phoenix, Ari-

zona, to a minimum of 45 below zero at Bismarck, N. D."

Economic Data.—"There were, in 1920, 33,000,000 males and 8,500,000 females (about 40 per cent of the total population) 10 years of age and over who were engaged in gainful operations. Thirty-one per cent of employed persons are engaged in manufacturing and mechanical industries and 26 per cent in agriculture, forestry, and animal husbandry." Thus 40 per cent of the people support the remaining 60 per cent, who include, of course, children, the aged and retired.

"The per capita income of the consumers of medical service (all the people) has been estimated for 1929, by the National Industrial Conference Board, at $692. This is merely an average, and does not at all represent the distribution of purchasing power. Of the 42 million occupied persons, about 86 per cent in 1918 earned less than $2,000 a year. At the other end of the scale, 2 per cent of earned incomes were more than $5,000 a year. Family incomes are somewhat larger than individual incomes. In 1926, about 48 per cent of all New York families had incomes of less than $2,500.

"The minimum cost of maintaining a 'fair American standard of living' for the family of an industrial worker has been estimated to range from $1,442 to $1,660, varying somewhat with the size of the city in which the worker resides. Since, according to 1918 figures, 39 per cent of the employed people had incomes of less than $1,500, they could not support a family at a 'fair American standard' with only one wage-earner. In some instances, of course, one family had two or more incomes."

"Extent of Illness and of Physical and Mental Defects.—A great variety of diseases and mental defects disable many members of the national community or prevent them from living in complete health. There are, on the average, two illnesses per person per year for which medical care is desirable or necessary and three defects per person, a considerable proportion of which probably requires medical treatment. About two per cent of the population of the United States are disabled by illness on any 'average' day of the year."

Two per cent of 123,000,000 would be 2,460,000 persons. The potential earning power of these persons might be estimated, say, at $2.00 per day, a wage far below the "fair American standard of living," and we have a daily loss of $5,852,000 in wages. This does not even come close to the actual loss, as you will recognize, but it gives a definite picture. The question arises, how much of this is preventable, and here is the crux of the whole situation.

Business men are interested in their losses sustained by the poor health of their employees. They are questioning the present methods of meeting their demands and in some cases they are taking the matter into their own hands and hiring medical services at so much per and getting results from a monetary point of view. You may have your own ideas of the standard of medical services dispensed by these hired servants, but the fact remains with the employer that in the aggregate he has saved money, and that talks with him. Just take this trend of medical care dispensation and glimpse, if you will, into the political and sociological possibilities, which are easily perceived by the smart politician and social worker, trained or untrained, and you see the reason for all the barriers we mentioned at the beginning. Project yourself just one step further and come to your own conclusions regarding state medicine or whatever name you wish to call it, for we are not standing still.

"Costs of Medical Care.—Various studies place the average cost of medical care at $70 to $230 per family per year, and estimates of the total for the United States as a whole range from $2,000,000,000 to $3,000,000,000 per year. The 'average' figures, however, are relatively meaningless in this field because of the extreme range among families, even among families in the same income group."

THE SUPPLY OF MEDICAL SERVICES

"I. The Supply of Medical Facilities.—Nearly 1,500,000 persons are now engaged in supplying various types of medical services to the people of the United States. Of these, 143,000 are physicians, and 67,000 are dentists. There are over 850,000 hospital beds in the country, of which 370,000 are in nervous and mental hospitals. There are at least 5,700 out-patient departments and other clinics in the United States, only a few of which are private group clinics.

"Although this existing supply of medical personnel, hospitals and clinics may be adequate or nearly adequate for the present existing demand,

quite another question is raised if it is compared with the supply necessary to meet all the people's real needs.

"*II. Basic Costs of Medical Care.*—Medical service is not a 'free good.' Its costs of production are high, and must be met, either by the community or the individual consumer. The main items in the cost of production are the costs of training personnel, the capital investment in hospitals and in private practice, and the current expenses of hospitals and practitioners.

"1. *Costs of Training Physicians.*

"a. *Preliminary requirements.* A large percentage of medical students now take four years in liberal arts work before entering upon their medical courses.

"b. *Medical course.* Most medical courses now require four years of work, so difficult the student has little time for earning his expenses. (Less than $300 a year was the average for 518 students who reported earnings to the American Medical Association; less than half of the total number of students and any earnings.)

"c. *Internship and postgraduate work.* Practically all physicians now take an internship. In addition, the practice of taking special courses is growing among physicians who expect to specialize.

"d. *Total cost.* The cost of medical education to the student or his family is estimated to be about $4,500; an additional large item in the 'cost of production' of a physician is borne by the medical schools and hospitals and thus, indirectly, by the public.

"2. *Costs of Training Dentists.*—The dental curriculum increased in the majority of schools from two years in 1890 to four years by 1917. The total income of forty-two dentist colleges for the year 1924-5 was nearly $6,000,000, of which nearly $3,000,000 was paid by students, and $1,600,000 by patients.

"3. *Capital Investment in Hospitals.*—It is estimated that the capital investment of American hospitals now totals at least $3,125,000,000 and that at least $200,000,000 per year is spent in replacements, additions, and new projects. This ranks the 'hospital business' as one of the leading businesses in the United States.

"4. *Capital Investments of Individual Practitioners.*—In addition to the time and expense of education and training, the individual practitioners of medicine and dentistry frequently invest considerable sums in equipment. The mean average investments made during a ten year period by sample groups of practitioners covered in community surveys range from $1,860 to $3,310 for physicians and from $1,698 to $5,927 for dentists. The crude unweighted averages are $2,700 for physicians and $3,100 for dentists. These averages include only expenditures during a ten year period, while some equipment, of course, lasts longer than ten years. The total investment, therefore, for a physician's or dentist's entire professional life is undoubtedly greater than these amounts.

"*III. Current Expenses of Hospitals and Practitioners.*—Current hospital expenditures have been estimated at $4,000,000,000to $550,000,000 annually. They are large and tend to grow larger with the increase of hospitals and the growing complexity of care furnished therein.

"Private practitioners have current expenses for office rent, supplies, clinical and nursing assistance, laboratory costs, etc. The crude average ratio of expenses to total gross incomes as found in the community surveys is forty per cent for both physicians and dentists.

"*IV. Incomes of Practitioners.*—The 'average' net incomes of physicians and dentists in five community surveys are:

	Physicians	Dentists
Shelby	$3,419	$2,744
Philadelphia	5,156	5,102
Detroit	5,596	6,067
Vermont	4,998	4,187
San Joaquin	7,187	4,875
Crude unweighted average	$5,271	$4,595

"These averages, however, like the average incomes of other people, are far from representative of the bulk of the practitioners. A distribution of the incomes of physicians and dentists in Philadelphia indicates that one-half of the physicians earn less than $4,207 and one-half of the dentists less than $4,000. The same general type of distribution was found in Detroit. Private duty nurses in Philadelphia report annual incomes averaging about $1,300 (a more representative figure in this case)."

During the last few months much other data has been collected: Dental Income Study, Medical Student Costs, Costs of Equipping Dental Office, etc. In each of these studies and all those that have been made up to last May certain definite tendencies are noticeable. For instance, just one, the tendency to specialize in some branch,

leaves the number of general practitioners below actual needs in certain districts, and above in others. We note from our field studies that the so-called specialist these days has a larger income than a general practitioner, and quite naturally the rank and file want to become affluent. Have you stopped to think what the 86 per cent of the people of this country are going to use for money when they are directed to employ a specialist in the present order of things?

Here is a bit of interesting data found to be true in Shelby County, Ind. The people of this county spend more for patent medicine in a year than they do for the services of physicians. This opens the field for "lay medical education," if I may use the caption. How far should we go with this phase of the problem? How much does the public deserve and where should it come from? It is just a possibility that we have been so interested in the purely scientific phase of our professions that we have forgotten to dispense the proper educational propaganda to insure our professional lives. I know how hide-bound you and I are in our ethics and we are both afraid to step out with a new program, but if we do not, some one who knows a whole lot less about our ethical and altruistic tendencies than we do ourselves will, and by popular consent, not ours. We will have to acquiesce, as the professions have had to do in the older countries.

Not many of us are hankering to go to Austria or England to practice. On the other hand, not many of us are trying to devise ways and means whereby our existence as private practitioners will be insured in this country. This brings me to the subject of the evening, and here I cannot refrain from giving a little historical data regarding the entry of the three countries, I have already mentioned, into socialized medicine.

I mentioned that Germany was socialized by imperial edict. This happened almost over night and it was done to satisfy pressure brought to bear by the working classes. The professional men were not taken into consideration, and medicine has not improved perceptibly, especially since the war, and now less than 5 per cent of the physicians in Germany have private practices.

In England the people of the lower economic classes put on the pressure and, while the process of getting the law through took considerable time, the professional men simply tried as individuals to stem the tide by saying "it can't be done" and "it must not be done," and finally in 1911 it was done and the physicians and dentists have been fighting for twenty years to make it possible for a patient to choose his own physician. This was finally accomplished one year ago last July.

France has a little different story. A number of years ago, the professions realized that it was just a matter of time before the issue of socialized medicine would come directly before their lawmaking body. The socialistic tendencies were definite and easily recognized. Men of sound judgment were sent to the surrounding countries and all available material gathered and studied by the professions. The professions, as a result, united into a working body and became distinctly politically minded. By the time the laws were drafted and finally passed, every governmental committee of any kind which dealt with health measures in any degree had at least one strong member from the medical and dental professions as a member of it, and the result is that the most healthy condition, from a medical economic point of view, obtains in France. The insurance companies happen to be in the unfavorable position. The outcome in France to date is the result of concerted effort on the part of both professions. It has taken a solid front to accomplish what they have done. I have not the time to go into details regarding the exact status in any of these countries, but sufficient to say, that from a medical economic point of view, which, by the way, is at all times altruistic, France leads Europe.

The spirit of coöperation must pervade the medical groups in this country to insure the proper guidance of the tendencies of socialized medical legislation. It is foolish to think we have no such tendencies. All but four states have compensation laws. All the foundations have been laid. Our unhealthy complexes, if we have them, must be put aside in oncoming years if we can hope to cope with the problems which will be forced upon us as sure as fate. Perhaps you are beginning to feel sorry for me in my apparent sentimental state of mind. I am well aware that sentiment alone does not suffice in arguing a case before logical judgment. On the other hand, mere statement of fact will scarcely ever win a debate with the popular mind as the judge. Combine logic with the proper amount of sentiment and you have an appealing and convincing prescription. For sentimental reasons,

I might call a plumber to plaster my house, but as a matter of fact I would have a terrible mess of things if he attempted the job. By the same token, why should an insurance adjuster, politician, or any other unqualified person dictate the medical welfare of this nation? Remember we are not going to be called into politics or social service by the laity. It is our business, and we should be about it. We are part of the so-called learned professions which comprise the upper fifth of the intellectuals of this country, and are expected to lead the way in our particular phase of life. Any misstep on our part might mean the hampering of our scientific, social and economic status for a generation or more to come.

In conclusion, I should like to make this very earnest appeal. Let every man in each profession representing medical care become interested to full capacity in the political and economic, as well as professional side of his profession. Let each man be tolerant of his brother practitioner and be willing to work in harmony for the upbuilding of the professions at all times, and especially stand as a man against any belittling or disorganizing propaganda which might be brought to bear from outside sources. Finally, it is my conviction that the three principles proposed by Dr. Ray Lyman Wilbur will not only safeguard the public, but the professions as well, and they are:

"1. The personal relation between patient and physician must be preserved in any effective system of medical service.

"2. The concept of medical service of the community should include a systematic and intensive use of preventive measures in private practice and effective support of preventive measures in public health work.

"3. The medical service of a community should include the necessary facilities for adequate diagnosis and treatment."

SURGICAL CONSIDERATIONS OF ANGINA PECTORIS*

ALFRED W. ADSON, M.D.
Rochester, Minnesota

THE syndrome described as angina pectoris represents a complicated pathologic cardiac mechanism; hence it is unreasonable to expect any one form of medical or surgical treatment to relieve all anginoid pains. The paroxysmal attacks are believed to be initiated by anemia or anoxemia of the cardiac muscle under increased exertion. The constant pain in the precordium which radiates down one arm or both arms is due probably to neuritic changes accompanying the organic disease of the aorta, coronary vessels and myocardium.

Various opinions are held concerning the pathologic etiology. Some observers hold that sclerotic changes in the aorta are responsible for the paroxysmal attacks, and many others believe that the sclerotic changes in the coronary vessels with the associated myocardial degeneration are responsible for the attacks. However, since many attacks are initiated by emotion, aggravated by exertion and are temporarily relieved by vasodilating drugs, it is fair to assume that vasomotor spasm of the coronary arteries or their terminal branches contribute to the syndrome, and that surgical intervention may be called on to assist in relieving the vasomotor or painful stimuli.

The mechanism of the heart is controlled by efferent and afferent nerves from the vagus and sympathetic nerves, in addition to its intrinsic nerves. The depressor nerve has its origin in the superior sympathetic ganglion and in the upper ganglion of the vagus nerve. Following the fusion of the nerves from these two sources it travels free in the neck to end in the suprasigmoid portion of the aorta, and according to Koster and Taschermak, it is known to be a purely sensory nerve to the aorta. Other vagal fibers communicate with the superior, middle and inferior cardiac nerves and according to Green are capable of influencing acceleration as

*From the Section on Neurologic Surgery, The Mayo Clinic, Rochester, Minnesota. Abstract of paper read before the Minnesota Society of Internal Medicine, St. Paul, November 1, 1931.

well as carrying depressor stimuli. The sympathetic accelerator nerves, according to Ionescu and Enaschesu, and to Cannon and his co-workers, take origin from the upper five thoracic ganglia and enter the cardiac plexuses by the cardiac nerves and by direct communication from the third, fourth and fifth thoracic ganglia. The vasomotor stimuli from the upper thoracic sympathetic ganglia pass through the upper thoracic trunk and the three cervical ganglia to enter the superior cardiac nerve, thence to be disseminated through the cardiac plexus to the coronary arteries. According to Ranson, Edgworth and Kuntz, painful stimuli from the cardiac and coronary mechanism reach the upper part of the thoracic portion of the spinal cord by medullated fibers which pass through the middle and inferior cardiac nerves, middle and lower cervical ganglia, the two upper thoracic ganglia, the white rami communicantes, and the dorsal roots.

Jonnesco, in 1916, at the suggestion of Francois Franck, resected the cervicothoracic sympathetic trunk including the middle cervical and stellate sympathetic ganglion for angina pectoris. Coffey and Brown advocated resection of the superior sympathetic ganglion on one side or on both sides. Cutter, Penfield and Gilbert, Kerr and many others have reported numerous experiences in the treatment of angina pectoris by sympathetic cervicothoracic ganglionectomy and trunk resection by the anterior Jonnesco approach. White had advocated paravertebral injection of alcohol of the upper five thoracic nerves on the left side for anginoid attacks.

Since the results have varied from complete success to partial success and failures, I have been impressed with the fact that the good results of surgery will depend on the more accurate selection of operation for the individual patient. In order to arrive at such a selection I believe much can be learned in comparing the symptoms, pathologic changes, and results obtained by medical treatment, and by sympathectomy in disease of the peripheral vessels of the extremities with those of the coronary vessels of the heart, as it is my impression that many analogous lesions exist.

Raynaud's disease of peripheral vessels may be compared with angina pectoris of the mild type in young subjects, in whom arteriosclerotic changes cannot be demonstrated. But as Raynaud's disease progresses, trophic lesions soon develop and give rise to degenerative lesions in the skin, subareolar, fibrous, nervous, muscular, ligamentous and osseous tissues which may be compared with the myocardial changes and be responsible for continuous pain and the intermittent claudication on increased exercise. The pathologic changes and symptoms following arterial sclerosis of the arteries of the legs and feet unquestionably simulate the cardiac syndrome in senile patients. The patients complain of continuous pain and intermittent claudication, and neither group receives relief from vasodilating drugs or from operation. The pain is only relieved by interrupting the afferent fibers either by section or by destruction of nerves with drugs.

It is possible that thrombo-angiitis obliterans with its associated vasomotor spasm may be the predominating factor in the production of coronary infarcts in middle-aged men, since I have seen at necropsy lesions of the coronary arteries that were similar to those previously recognized and demonstrated in the vessels in the feet and legs. The occlusive lesions due to arterial sclerosis of peripheral vessels which result in pain and gangrene again appear to be analogous to the coronary disease, only death ensues before the terminal stages of degeneration of muscle take place.

Therefore, in the light of anatomic and pathologic evidence one might assume that angina pectoris occurring in a young person might be due to vasomotor spasm of the coronary arteries, which explains why vasodilating drugs or any operation that divides nerve fibers carrying vasomotor responses gives relief. It is in this group that single or bilateral superior cervical sympathectomy has been so effective.

If, however, one were dealing with two etiologic factors, that is, organic lesions of the coronary arteries with a superimposed vasomotor spasm on normal coronary branches, superior cervical ganglionectomy would fail to give the results accomplished by a Jonnesco operation, since the later operation not only includes the vasomotor fibers but many of the afferent pain fibers returning through the middle and inferior cardiac nerves. When this operation is indicated the posterior approach to the cervicothoracic ganglion is more effective, since there is less chance of missing the first thoracic ganglion by the posterior approach than there is by the anterior superior approach. However, if the cardiac lesion is void of any vasomotor phenom-

ena and is due to coronary or aortic sclerosis, it is readily understood why patients may continue to have light attacks of pain, even though both cervicothoracic ganglia have been removed, since the fibers of the depressor nerve and the second, third and fourth thoracic nerves receive afferent fibers carrying painful stimuli independent of the superior, middle and inferior cardiac nerves, and it is in such cases that vasodilating drugs likewise fail and paravertebral alcoholic injections have to be resorted to for symptomatic relief.

Therefore, surgical treatment of angina pectoris is indicated if patients are young, if they present vasomotor phenomena, and if they would otherwise be compelled to undergo medical treatment for years. Sympathectomy is indicated in conjunction with medical treatment when either treatment alone fails to give complete relief. Paravertebral injection of alcohol of the upper thoracic nerves is a procedure that is indicated in extremely senile patients when medical treatment fails, and when the lesion is due to sclerotic changes rather than to vasomotor spasm.

AIDS IN THE DIAGNOSIS OF HIP-JOINT DISORDERS*

GEORGE A. WILLIAMSON, M.D.
Saint Paul

THE hip-joint provides more difficulties than any other joint, to beginners and experienced alike, when it becomes necessary to determine the nature of some disturbance of function due to disease or injury. The depth of the joint from the body surface makes direct palpation impossible or unreliable and one is forced to rely more and more upon signs and various measurements in arriving at a diagnosis. A proper understanding of some of the common signs and measurements is necessary if one is to reduce his percentage of error in diagnosis to a minimum. Usually a child with a limp reporting for treatment causes some worry and consternation when it walks into the office, and it is only by most painstaking palpation, mensuration, radiographic and laboratory examinations that one is able to arrive at the correct interpretation of the existing condition.

It is not the purpose of this brief paper to discuss at length all the details of various signs but to merely refresh in your minds the ones most frequently used, and therefore most practical and dependable.

The hip is a ball and socket joint, stable, strong, and freely movable by virtue of its deep, solid bony socket made up of parts of the ilium, pubis and ischium, its reinforcing ligaments and powerful muscles. This joint is second only to the shoulder in its mobility and is supplied with checks against an excessive range of motion. As an example one finds the iliofemoral or "Y" ligament of Bigelow preventing hyperextension beyond the normal 45°. In like manner flexion, adduction, abduction and rotation are checked by ligaments, the various muscles attached about the hip joint, or by the approximation of adjacent parts of the body.

The most important aid in the diagnosis of hip disease is a knowledge of the etiology of changes in the gait. It is quite essential for the patient to be stripped for the examination. Before any other examination is made the patient should be asked first to stand and secondly to walk across the floor so that the erect posture and gait may be studied. There is no doubt that careful observation from these two aspects saves a great deal of time as the attention is immediately directed to the abnormal extremity.

Pain in the hip causes a very characteristic limp which can hardly be mistaken once it has been seen. Putting the weight down on the extremity of the affected side causes pain which results in the patient flinching and hopping quickly onto the other leg. The steps taken on the affected side are very short and when standing all the weight is borne on the normal leg.

A limp caused by a flexion deformity necessi-

*From the Department of Orthopedic Surgery, The Miller Clinic, St. Paul.

tates a sudden forward movement of the entire body as the weight is brought down on the affected side, giving to the gait a typical bowing movement. When standing erect the flexion of the hip is compensated for by increasing the lordosis of the lumbar spine. Most of the weight is borne on the normal side or on both feet by standing on the toes with the affected foot held in the equinus position (Fig. 1).

When the hip is deformed in the abduction position the extremity is held away from the midline of the body as it is apparently lower than its normal companion. When the deformity is one of adduction the hip of the affected side is very prominent, the extremity apparently shortened, and the gait has a characteristic lurch. When observed from in front the relationship of the adducted or abducted extremity to the pelvis remains unchanged during every phase of a step whereas normally this relationship changes with each phase.

If the extremity is shortened the patient walks on the toes of the affected side or due to the dropping of the pelvis on that side with each step he is obliged to lean the entire body toward the affected side as he steps, conpensating for the shortening when standing by the development of a postural or static scoliosis which later becomes a structural one.

The limp of a congenitally dislocated hip is typical in both the unilateral and bilateral cases. Due to the dislocation of the head of the femur from the acetabulum, each time the patient steps on the affected side there is no fixed point of support for the body weight, and as a result the pelvis drops on the unaffected side, producing a lurch in the gait, with the patient rising on the stable side before making his next step. If both hips are dislocated the gait can be likened to that of the waddle of a duck. A marked lordosis with prominent buttocks is also a conspicuous feature, as is external rotation of the feet, and the widening of the perineum.

After a study of the gait and attitude of the patient one may proceed to the true determination of the nature of the deformity by measurement of the ankylosed positions of the joints, range of motion in partially ankylosed joints, stability of the joints on weight bearing and the comparative length of the extremities. This examination concerns chiefly the topographical anatomy of the hip joint.

There are many lines and prominences on the body surface which may be utilized for determining changes in the position of the head of the femur in respect to the acetabulum, due to dislocation, fracture, disease and destruction of either part, or changes in the relative positions of the greater trochanter and head of the femur such as one finds in alterations of the angle of

Figure 1. Lateral view of a patient with hip joint ankylosed in a flexed position shows the marked increase in lumbar lordosis necessary to get the limb into the vertical axis of the body. The foot on the side of disease is held in equinus so as to get weight-bearing on both feet by standing on the toes.
In order to get weight-bearing on both feet it is necessary to keep the foot in equinus on the side of the disease, making up for the shortening to some extent.

the neck of the femur in the so-called coxa vara and coxa valga.

The prominences used to determine various lines are the anterior and posterior superior iliac spines, the tip of the greater trochanter of the femur, and the tuberosity of the ischium.

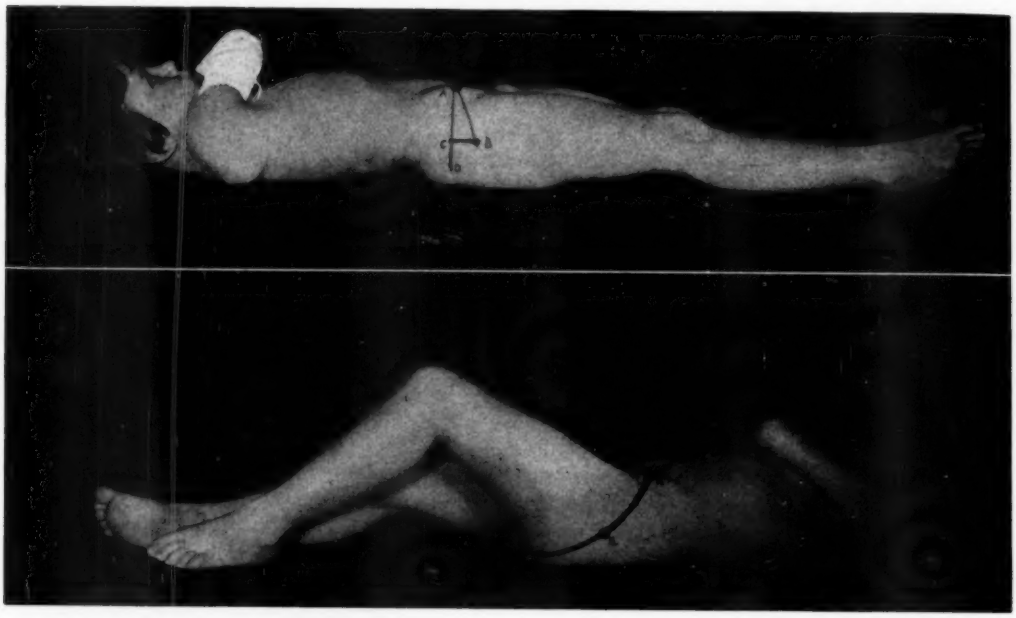

Figure 2. *(above)* Bryant's line or triangle.

With the patient lying on her back on a table a vertical line is dropped from the anterior superior spine (A) to the table. A line (A-B) is then drawn from the anterior superior spine to the tip of the greater trochanter. A line (B-C) is then drawn from the greater trochanter perpendicular to (A-D) forming the base-line of the triangle A-B-C. This triangle is referred to as Bryant's triangle or the base-line as Bryant's line.

(below) Nelaton's line.

With the hip flexed about 50° a line ABC drawn from the anterior superior spine to the ischial tuberosity passes through the tip of the greater trochanter (B).

It is intended here to enumerate a number of these signs indicating wherever possible the comparative value of each.

Bryant's line or triangle is probably the most universally used because of the possible accuracy of the measurements. With the patient on his back on a table a perpendicular line is dropped from the anterior superior spine forming one side of the triangle. A line is then drawn from the tip of the great trochanter to the anterior superior spine forming the hypotenuse of the triangle. A third line, drawn at right angles from the perpendicular line to the tip of the trochanter, forms the base and it is to this line that Bryant refers chiefly. Normally the length of this base line should be equal on both sides. If the line is shorter than on the normal side it means that the trochanter is in a relatively higher position than normal due to dislocation of the hip, destruction of the head or neck of the femur or roof of the acetabulum by disease or fracture, or to a decrease in the angulation of the neck of the femur with the shaft thus approaching a right angle as in coxa vara. In contrast, if the line is longer than on the normal side we may have dislocation of the hip below the acetabulum, or a change in the angulation of the neck of the femur with the shaft approaching a straight line as in coxa valga. In Bryant's opinion the chief value of this line was to demonstrate impaction of a fracture of the neck of the femur although we have come to use it more generally.

Nelaton's line may be placed next in order as it is probably the second in usefulness and in

familiarity. If the anterior superior spine is joined to the tuberosity of the ischium by a straight line the tip of the greater trochanter will be crossed by this line. The trochanter will be found riding above this line in the same conditions which cause a shortening of Bryant's line and riding below this line with lengthening of Bryant's line (Fig. 2).

Among the other less familiar lines are:

1. Petersen's line which is a horizontal one drawn through the upper border of the symphysis pubis. Normally the tips of the greater trochanters are level with this line. Its usefulness is limited, however, as it is difficult in many patients to define the upper border of the symphysis.

2. Shoemaker's line is interesting especially in congenital dislocation of the hip. This is merely the prolongation of the line joining the tip of the greater trochanter to the anterior spine across the median line of the abdomen. Normally this line bisects the median plane at or above the umbilicus, whereas, if the hip is dislocated or involved by any of the factors accompanied by a shortening of Bryant's line the median plane is crossed below the umbilicus (Fig. 3).

The gluteal folds form a horizontal line if the legs are of the same length and form an angle with the horizontal if the length of the two legs is different.

Morris' bitrochanteric test is useful at times although one can obtain almost as reliable information by speculation and Bryant's line. A measuring stick calibrated from the center toward each end is placed so that the center corresponds to the median plane of the abdomen. The distance of each greater trochanter from the mid-line is measured. Destruction of the neck of the femur, the head, or the acetabulum due to fracture or disease may lead to a loss of length in this line as compared to the normal side. For practical purposes this test may be cast aside.

In addition to information regarding the relative position of the head of the femur and greater trochanter to the acetabulum one must frequently make comparative measurements of the two extremities as regards length, flexion, adduction, abduction, and rotation. It is of prime importance in the correction of hip deformities for one to be thoroughly conversant with the methods of measuring the length of the legs as well as the degree of adduction, abduction, or flexion in deformities.

Restriction of flexion probably occurs most frequently in hip deformities although it is rarely found unaccompanied by adduction or abduction limitations. It is very important to differentiate a permanent flexion deformity due to disease of the hip joint from that often found accompany-

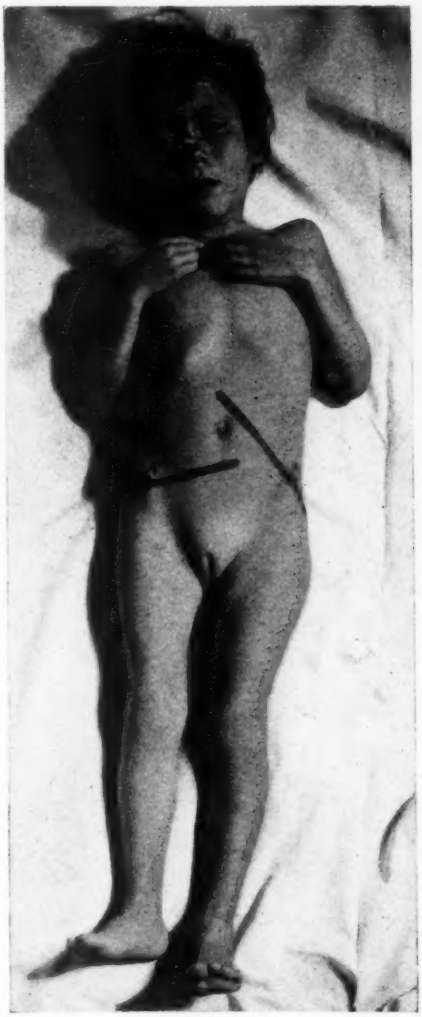

Figure 3. Shoemaker's line.

A line connecting the greater trochanter with the anterior superior spine if extended onto the abdomen crosses the mid-line at or above the umbilicus. If the hip is dislocated as on the right side in this illustration the line will cross the midline of the abdomen at a point below the umbilicus.

ing a psoas abscess. In this latter condition the only motion limited is that of extension. It is possible to flex the thigh beyond the deformed position as well as to rotate it throughout its normal range without pain. If the deformity is due to hip joint disease, motion if at all possible will be accompanied by pain. The limitation of motion will be present in all directions due to destruction of the articular surfaces of the bones, involvement of the ligaments and capsule, or deformity of the head of the femur or of the acetabulum.

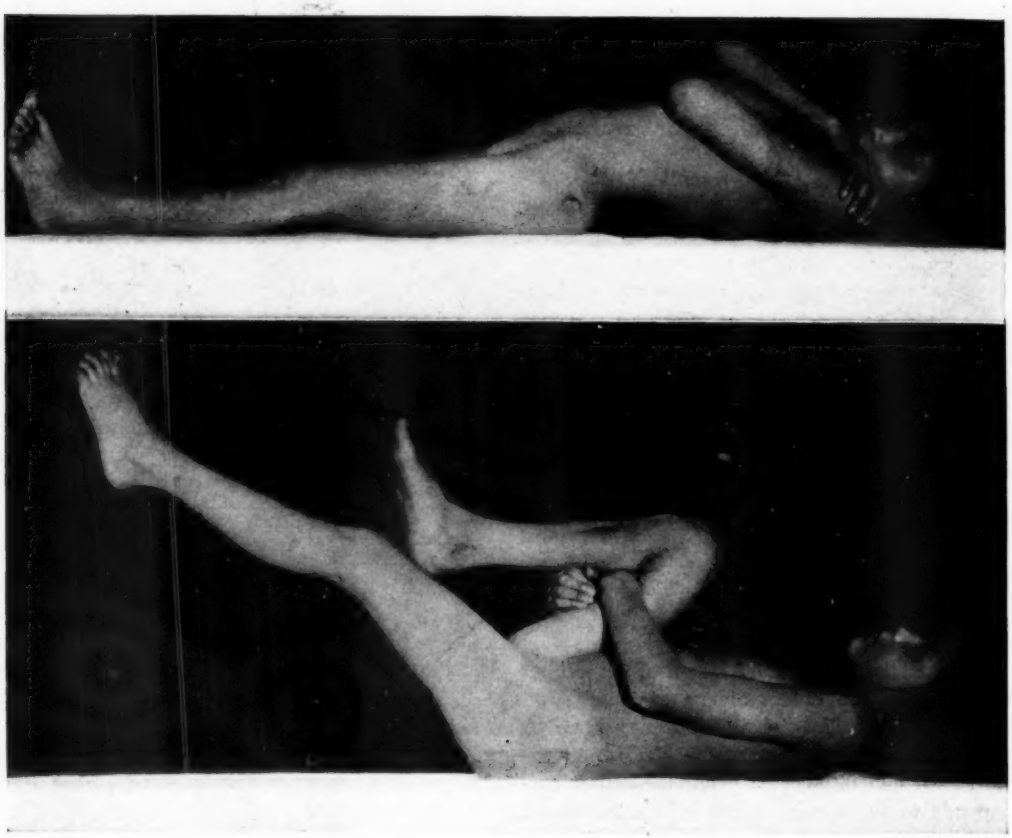

Figure 4. Thomas test for hip-flexion.

The patient is placed on the back flat on a table. If the legs are completely extended as in the upper view the lumbar spine becomes arched forward if there is a flexion deformity in the hip.

In the lower view the patient grasps the normal extremity with both hands, flexing it firmly against the abdomen, thus fixing the pelvis and flattening the lumbar spine.

The other extremity then assumes a position at an angle with the horizontal equal to the degree of flexion present in the hip.

Normally flexion of the hip is possible from the horizontal up to a point at which the thigh comes in contact with the abdomen if the knee is flexed. In deformity the hip may be stiff in any position inside this range. As the "position of optimum function" of the hip as regards flexion amounts to 10°-15° it is necessary to be able to determine whether an increase or decrease of flexion is present. It is true that many times one is able to judge fairly accurately the number of degrees of angulation. However, the goniometer or some mathematical table should be used for exact determinations.

The Thomas test for hip flexion should be

understood as it is a prerequisite for accurate measurement of the degrees of angulation.

The great flexibility of the spine allows a patient to compensate for a marked flexion deformity of the hip, by increasing the normal mild lordosis in his lumbar spine (Fig. 1). If the flexion deformity is not marked it is often difficult to detect this compensatory adjustment. That it is impossible to extend the flexed ankylosed hip without producing lordosis in the lumbar spine forms the foundation for the Thomas test (Fig. 4).

The patient is placed in the horizontal position on his back on a table or other hard flat surface. A bed will not do. He is told to hold the normal leg flexed firmly against the abdomen, using both hands for this purpose. By this means the lumbar spine is held flattened against the table and

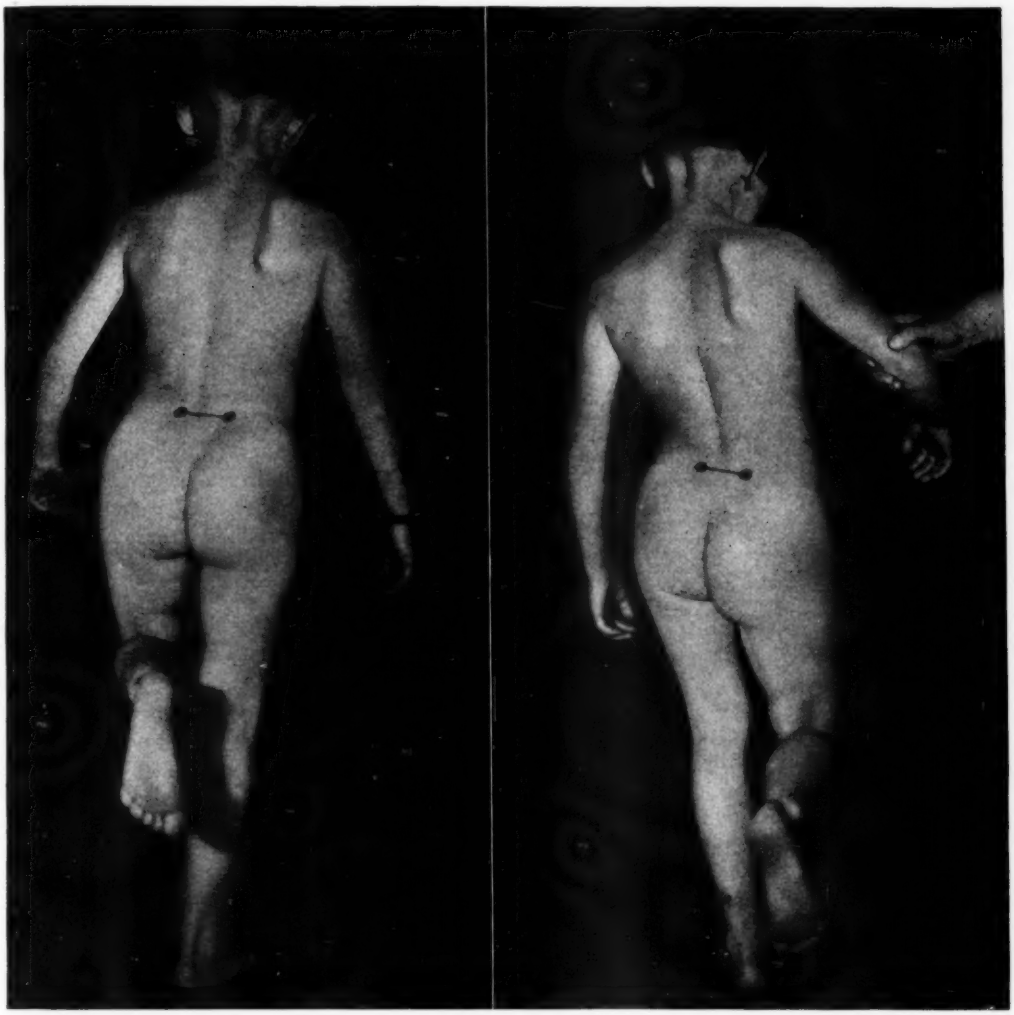

Figure 5. Trendelenburg sign.

A shows the patient standing on the normal extremity with the pelvis raised on the opposite side. Figure B shows how the pelvis drops when the patient stands on the dislocated extremity. The instability of the left hip makes it necessary for the patient to be supported when the weight is borne on the left leg.

The transverse line connects the posterior superior iliac spines.

the pelvis is fixed. The other extremity with the knee held straight assumes an angle with the horizontal equal to the number of degrees of flexion deformity in the hip. This angle may be measured by a goniometer or by taking the vertical

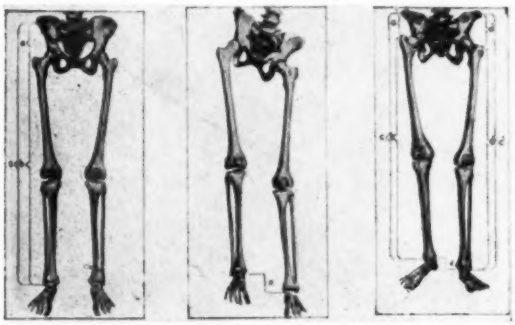

Figure 6. (From De Quervain's Surgical Diagnosis)

This is intended to show on the skeleton what is meant by apparent and real shortening. A is the distance from the greater trochanter to the level of the anterior superior spine previously referred to as Bryant's line. C is the measurement usually made from the anterior superior spine to the malleolus of the tibia and referred to as the actual length of the leg.

In the central figure the difference in the length of the legs produced by tilting the pelvis or adducting the extremity is shown. The actual length from the anterior superior spine to the malleolus is the same although the adducted leg is apparently shorter. The distance from the umbilicus to the malleolus on the right side is shorter than the distance between the same points on the left side. This difference is the apparent shortening.

The figure on the right shows real shortening due to a fracture of the neck of the femur. This shortening would be shown as a shortening of Bryant's line and a diminution in the distance from the anterior superior spine to the malleolus when the pelvis was held level.

distance to the table from a point on the leg 24 inches distal to the greater trochanter and consulting the table devised by Kingsley in 1888 for estimating the degrees of flexion. It is necessary to have ready access to Kingsley's table is one is to be able to utilize this method conveniently.

In addition to being able to measure the amount of flexion deformity in a stiffened hip it may be necessary to determine the range of flexion in a partially stiffened hip. After flexing the normal thigh on the abdomen as in Thomas' test so as to fix the pelvis one is able to determine the degree of further flexion possible before resistance is met. By making measurements as described in Kingsley's table or using the goniometer, accurate readings of this range of motion may be obtained.

A word of caution may be inserted here relative to using the Thomas test in acute hip lesions. Due to the extreme degree of pain often present it is necessary that the affected limb be supported by the examiner when the normal limb is flexed to the abdomen

The Trendelenburg sign is a true indicator of the weight-bearing stability of a hip joint. Standing upon a normal extremity the opposite leg is raised from the floor by bending the knee. In order to keep the center of gravity of the body directly over the center of support, the pelvis is raised by the lateral abdominal and spinal muscles on the side of the flexed knee while the gluteal muscles on the weight bearing side immobilize this hip. If the hip is dislocated on the weight-bearing side it is impossible to obtain a fixed point for support, namely, the head of the femur in the acetabulum and the lateral abdominal muscles of the opposite side cannot function as before. As a result, the pelvis drops and the patient falls to the side away from the weight-bearing leg.

If both hips are dislocated this dropping of the pelvis on the side opposite to that of support is obtained when each extremity, in its turn, is raised. The patient has a bilateral Trendelenburg sign. It is not hard to see the effect upon the gait that this instability of the hip or hips would have (Fig. 5).

It might be well to mention at this point that a positive Trendelenburg sign is also obtained in at least three other conditions, namely: (1) coxa vara; (2) ankylosis of the hip in adduction; and (3) infantile paralysis involving the lateral abdominal and spinal muscles.

While on this subject of congenital dislocation Malgaigne's sign might be called to mind. The patient is placed on the normal side on the table with the affected hip and the knee flexed. The examiner grasps the uppermost extremity by holding the knee in one hand and placing his other hand on the buttock. One pushing dorsally in the long axis of the flexed femur a prominence is produced in the buttock. If only one lump is felt it is the greater trochanter and the hip is not dislocated. If two lumps are felt they are the head of the femur and the greater trochanter and the hip is dislocated.

It seems hardly necessary to attach a proper name to such an obvious finding but as the test may appear in the literature it should be mentioned at this time.

Shortening of the extremity may be actual or apparent. The differentiation between these two

conditions is important and sometimes difficult to determine.

Before measuring the length of the legs one must be sure that the pelvis is horizontal in both planes and that both extremities bear the same relation to the perpendicular dropped from the line connecting the two anterior superior spines in so far as flexion, adduction and abduction are concerned.

The measurement is made from the under surface of the anterior superior spine to the tip of the medial malleolus or the sole of the foot and is probably more accurate if measured to this latter point.

Actual shortening is due to retardation of growth from disuse or disturbance of epiphyseal cartilage from congenital lack of development from disease, traumatic destruction, or displacement of the head of the femur or acetabulum.

Apparent shortening or lengthening is due to adduction or abduction deformities of the hip joint as the case may be. These apparent changes in length may be determined by measurement from the umbilicus to the medial malleolus of the tibia. If the hip is adducted the pelvis is tilted upward on that side so that the malleolus is brought nearer the umbilicus and an apparent shortening results. If the hip is abducted the pelvis tilts downward and apparent lengthening results. When the apparent shortening is greater than the real shortening the hip is adducted, and if the apparent lengthening is greater than the real lengthening the hip is abducted.

These measurements of apparent and actual shortening can be utilized to determine in degrees the extent of the adduction or abduction deformity of the hip. By taking the difference between the actual and apparent shortening and determining the width of the pelvis across the anterior superior spines one is able to use a table published by Lovett in 1888 to determine the number of degrees of adduction or abduction present. Here again it is necessary to have ready access to a table of figures in order to obtain the correct reading. Both the table and Kingsley's table mentioned above may be found in Whitman's Orthopedic Surgery or other similar textbooks (Fig. 6).

It is only by a special technic mentioned by Adams recently that one is able to measure adduction or abduction deformities on the radiograph. For all practical purposes it is not necessary to make an accurate measurement of adduction or abduction. If the anterior superior spines are joined by a horizontal line the degree of variation to either side from the perpendicular to this line can be estimated fairly accurately visually. The goniometer may be used if actual readings for purposes of record are desired. In the growing child the length of the legs changes rapidly when the hip is ankylosed in the adducted or abducted position due to the increase in the

Figure 7. Shenton's line.

This is a moderately severe example of the distortion of Shenton's line in a case of coxa plana. The right hip is normal.

Figure 8. Shenton's line.

The distortion of Shenton's line found in dislocation of the hip is very marked, as shown in this view. The right hip is normal.

width of the pelvis. One is tempted to ask why so much care is taken to put the hip at a carefully predetermined angle for ankylosis so that the legs will be of the same apparent length, knowing that this apparent length will change very soon with the growth of the pelvis.

From the radiological standpoint one does not have so many signs or measurements to remember. Of course, the radiograph demonstrates conclusively such conditions as pathological changes in and about the hip joint, congenital dislocations, traumatic lesions and so on, but sometimes the involvement is so mild that unless there are definite points or lines to be used as landmarks, variations from the normal may be missed.

In 1911, E. W. H. Shenton described a line bearing his name which acts as a very useful guide in the radiography. This line drawn along the outline of the lower surface of the neck of the femur and the upper rim of the obturator foramen forms an unbroken sweeping curve. If, for any reason, the head of the femur assumes a higher position on the pelvis on one side than on the other the curved line is broken. This forms a reliable guide directing the attention to the abnormal hip (Figures 7 and 8).

A straight line passing through the center of the sacrum and the symphysis pubis furnishes a useful fixed median plane from which the degree of adduction or abduction of the hip joint can be estimated. Accurate measurement cannot be made for recording unless the radiographs are taken with a definite technic such as that described by Adams.

SUMMARY

1. A careful study of the gait and erect posture should be made with the patient stripped.
2. A description of a number of characteristic limps is given.
3. Various test lines are described and their significance noted.
4. The Thomas and Trendelenburg signs are described with illustrations.
5. The value of Shenton's line is illustrated.

THROMBO-ANGIITIS OBLITERANS*

REPORT OF FIFTY-TWO CASES

ALEXANDER G. DUMAS, M.D.
Neuro-Psychiatric Consultant, U. S. Veterans' Hospital,
and
EDWARD T. EVANS, M.D., F.A.C.S.
Attending Orthopedist, U. S. Veterans' Hospital,
Minneapolis

A DISEASE of apparently increasing frequency, at least in its early recognition, and most insidious in onset, accompanied by varied manifestations which, in the early stages, tax to the utmost the diagnostic ability of the physician.

For various reasons we have for some time felt that it would be appropriate to informally discuss this disease and elucidate certain points which should aid in an early diagnosis.

After observation of individual cases over a period of years, both in the hospital and in the out-patient clinic at this station, we were impressed that too often the diagnosis is not considered in ailments of the extremities.

We have been impressed with the gradual development of the disease in the individual cases. As a result of our study of these in retrospect we feel that we can draw certain conclusions on subjective symptoms and objective findings in the early case.

Spontaneous gangrene of the extremities has been noted for years, as have also other less serious circulatory changes, but not with any clear understanding. Quesnay, in 1739, mentioned possible occlusion of the artery causing gangrene. Raynaud, in 1862, published his thesis "Local Asphyxia and Symmetrical Gangrene of the Extremities." Intermittent claudication was recognized. Von Winiwarter, in 1879, reported the first recognizable case and termed it endarteritis and endophlebitis. Since then, numerous cases have been reported, but it is difficult to determine the pathological classification in many. It re-

*Read before a joint meeting of the Hennepin and Ramsey County Medical Societies on October 30, 1929.

mained for Buerger, in 1908, to elucidate the pathology, and his criteria stand today as the basis for positive diagnosis. Since then, interest in the condition has steadily advanced, and many cases are reported, with suggestions as to etiology, diagnosis and treatment.

Brown, Allen and Mahorner have recently reviewed the subject most thoroughly.

The interest of one of the authors in the subject began in 1922, when he reviewed a series of amputations performed for this condition at the Boston City Hospital. To his surprise, he found that more than sixty per cent were of Irish extraction. As he looks back, he recalls that the diagnosis was made in the presence of gangrene and from pathological studies, and that early diagnosis was most rare.

That this state of affairs still exists cannot be denied. Many cases still go undiagnosed until major symptoms appear.

The opportunities afforded us to study the disease at this Clinic have been unusual, and we feel that a report, considering various means of diagnosis, is warranted at this time.

ETIOLOGY

The numerous suggestions as to etiology are evidence that as yet no single factor can be termed causative. It is, however, probable that infection is responsible. Rabinowitz claims to have isolated an organism which reproduced the lesion in rabbits, but his work has not been confirmed. English observers report the presence of a histamine-like substance in tissues, activated under certain barometric conditions, causing local changes similar to those in Raynaud's disease, and, if extensive, simulating endarteritis in its local end-stages. Typhus is mentioned. Only one of our cases had an indefinite history of this disease. Males are affected with only very rare exceptions. The use of tobacco and ergot have been discarded as anything but possible predisposing or aggravating factors. Buerger does not feel that exposure to wet or cold is a cause *per se*, but rather is an exciting factor predisposing to gangrene. We feel that foci of infection may play a part if local factors are favorable for the development of the disease.

PATHOLOGY

The pathology is not an endarteritis, but an occluding thrombosis affecting arteries and veins. This occlusion occurs usually in the deep vessels, but often is present in the superficial veins.

GROSS PATHOLOGY

The deep vessels of the amputated legs regularly show an extensive obliteration of the larger arteries and veins. Besides this, there are two lesions which vary greatly in their intensity—periarteritis, and, not infrequently, arteriosclerosis. The appearance of the vessels on gross section depends upon the age of the occluding process. Usually the vessel is seen to be filled with a grayish or yellowish mass that can be distinctly differentiated from the wall of the vessel, and that appears to be pierced at one or a number of points by an extremely fine opening through which a minute drop of blood can be squeezed. Such obturating tissue is firm in consistency, and does not at all resemble the crescentic or semilunar occluding masses typical of arteriosclerosis. The vessel itself is usually contracted, so that its wall appears somewhat thickened. This picture is characteristic of arteries or veins which are the seat of a very old obliterative process and is to be found most frequently in the peripheral portions of the vessels, although at times this type of lesion may extend throughout the whole length of the vessel, from the dorsalis hallucis into the popliteal artery.

The veins share equally with the arteries in the lesion of occlusion. In some cases they are more extensively involved than the arteries; this is particularly true of the collaterals of the posterior tibial, which are often closed when the anterior tibial veins are open. As for the arteries, we usually find an obliteration of a part or the whole of the anterior tibial, of the dorsalis pedis and of the dorsalis hallucis, an occlusion of the posterior tibial and plantar vessels, with or without involvement of the peroneal.

Besides the lesion of occlusion, there are two other striking changes, namely, a certain amount of arteriosclerotic thickening and periarteritis. Arteriosclerosis is absent in the younger cases; when present, it is never pronounced, except in those rare instances in which the patient has suffered from the disease for many years, and has reached the age of forty or over. As a rule, we note but very slight degree of whitening or thickening of the intima, here and there in the patent portions of the vessels. In a very few cases small atheromatous patches are present.

A much more interesting and more important change is the fibrotic thickening of tissues immediately about the vessels. Wherever the vessels are occluded, there is apt to be an agglutinative process which binds together the artery and its collateral veins and sometimes, also, the accompanying nerve, so that liberation of the individual vessel by dissection is difficult. The adhesive condition is due to fibrous tissue growth, and varies considerably in its amount. The periarterial fibrosis varies, sometimes being almost absent, at other times so great that isolation of the vessels or nerves becomes impossible and the vascular structures make up one dense rigid cord.

HISTOPATHOLOGY

The lesions may be considered in two stages: first, the healed or organized stage; second, the acute or incipient stage of thrombosis. Between the earliest alterations in the deep arteries and veins and superficial veins, and the final stage of the disease, there are a large number of intermediate pictures that illustrate the metamorphosis of the obturating clot into the intravascular cicatrix.

1. *Healed or Organized Stage.*—The most common lesion is a total obliteration of the lumina of arteries and veins by connective tissue. Histologically this may be extremely varied in the general appearance, but each picture can be interpreted correctly as having its origin in the lesion of occlusive thrombosis. This obturating connective tissue usually harbors numerous small vessels, pigment containing hemosiderin, and a fair amount of connective-tissue cells. The canalizing vessels, when they became dilated, form smaller or larger sinuses, giving the fenestrated or cribriform lesion seen on microscopic section of the vessels, or *when the canalizing vessel becomes eccentrically placed and sufficiently large, this sinus is responsible for the appearances which have been incorrectly interpreted as the product of an endarteritis obliterans.*

Elastic tissue stains demonstrate characteristic differences between this process and that of arteriosclerosis. Thus, the region of the organized clot is almost completely free from elastic tissue. The small amount which is present is concentrically disposed about the new formed vessels. The abundant elastic tissue formation in the arteriosclerotic plaques is well seen. A combination of thrombo-angiitis obliterans and arteriosclerosis is shown in some cases.

Still more suggestive and instructive is the finding of various stages of the disease in different members of the same vessel sheath. Thus, a large artery affords a view of the old lesion as well as one of its venæ comites. Another accompanying vein is in the "acute" stage of the disease, a smaller venule or satellite being in the intermediary stage, where certain "miliary giant-cell foci" make their appearance. Such pictures not only reveal the thrombotic nature of the disease, but also present an argument in favor of the following two assumptions: *that the disease begins with an inflammatory lesion attended with occlusive thrombosis, and that it affects the arteries and veins in a sort of relapsing fashion, very much in the same manner as the veins in migrating phlebitis.*

The termination of the occluding tissue in arteries and veins is often seen in the form of a rounded, convex projection looking upward (cephalad), and lying in seemingly healthy vessel wall. At other times, the old occluding tissue is capped by an additional clot rising in pyramidal fashion, ending by a long tapering extremity.

2. *The Acute or Specific Lesion.*—The early lesions are so characteristic histologically that their appearances are distinctly specific for thrombo-angiitis obliterans and perimt the pathologist to make a diagnosis of the disease. They are rarely to be seen in the deep vessels for the reason that patients do not allow amputation until the disease has lasted for months or years. However, they can be well studied when these are the seat of the typical migrating phlebitis, which has been shown by Buerger to be identical with the acute lesions in the deep vessels.

The earliest changes appear to be the usual evidences of an acute inflammatory process involving all the coats of the vessel. The media, adventitia, and perivascular tissues are infiltrated with polynuclear leukocytes, and the lumen of the vessel is completely filled with red clot. In the peripheral portions of the clot, large or small foci of leukocytes (purulent foci) begin to form, whose growth occurs by virtue of immigration of leukocytes. Certain peculiar and characteristic giant-cell foci then develop. They contain giant cells, endothelioid cells or angioblasts and numerous broken-down leukocytes. These foci then

undergo connective-tissue replacement. The giant cells gradually disappear, numerous small vessels are formed, the final product being fibrous tissue containing vessels and some pigment. In the rest of the occluding clot the organizing process is somewhat different, resembling that which characterizes the organization of blood-clot in other thromboses.

In short, the lesions in thrombo-angiitis obliterans are, in chronological order: an acute inflammatory lesion with occlusive thrombosis, the formation of miliary giant-cell foci, the organization and canalization of the clot, the disappearance of the inflammatory products, and the development of fibrotic tissue in the adventitia that binds together the artery, vein and nerves.

(*Note.*—Much of the above description of the pathology has been drawn verbatim from Buerger's monograph.)

DIFFERENTIAL DIAGNOSIS

Before discussing the differential diagnosis in circulatory disturbances of the extremities, we feel that a few words relative to the reason why the neuro-psychiatrist should be interested in this subject might not be out of place.

The United States Veterans' Administration has classified the angioneuroses, for compensation purposes, under neuropsychiatric disabilities, and, therefore, all cases presenting symptoms that might point to these conditions are referred to the Neurological Section. These include Raynaud's disease, erythromelalgia, trench feet, angioneurotic edema, acroparethesia, multiple neurotic gangrene, scleroderma, sclerodactylia, chronic acro-asphyxia, and familial gangrene.

In addition to these conditions, many of the organic neurological diseases, especially those involving the spinal cord, have circulatory symptoms. In cases of recent total transverse lesions of the spinal cord the lower limbs are usually abnormally warm, the greatest change occurring distally. This is due to vasomotor paralysis. Erythromelalgia is sometimes one of the earliest signs of organic cord disease, such as disseminated sclerosis, and this points to its origin from an affection of the spinal vasomotor centers, probably the nucleus sympatheticus lateralis between the anterior and posterior horns. Again, many patients with circulatory disease present early symptoms simulating neuritis and neuralgia. In addition, there may be traumatized or severed peripheral nerves, with ulceration, such as is represented in one case in our series, where the sciatic nerve was severed by a gunshot wound. Circulatory disturbances are common in peripheral nerve injuries, and frequently an artery is injured at the same time as a nerve.

Since thrombo-angiitis obliterans represents the largest disease entity in our group of circulatory disturbances, it must be differentiated from the other circulatory conditions. The conditions to be differentiated are placed in two large groups:

1. Organic vascular diseases of the extremities.
2. Cases of neuropathic or neurogenic vascular disorders.

Under the heading "Organic vascular diseases of the extremities" must be considered diabetic gangrene, arteriosclerosis, aneurysm, embolic or thrombotic gangrene, luetic endarteritis, peripheral nerve injuries, with or without blood vessel injury. In addition to these organic vascular diseases there are a few other diseases that have symptoms that occur in thrombo-angiitis obliterans, namely: myositis, metatarsalgia, neuritis, neuralgia, various cord diseases, pes planus, pes cavus and thrombo-phlebitis. Practically all of these conditions have claudication as a symptom.

The neuropathic or neurogenic disorders to be differentiated are: Raynaud's disease, erythromelalgia, trench feet, angioneurotic edema, multiple neurotic gangrene, scleroderma, sclerodactylia, chronic acro-asphyxia, familial gangrene.

For the clinical diagnosis of thrombo-angiitis obliterans, we must depend upon:

1. Sex—male predilection.
2. Early involvement of the lower extremities.
3. Early symptoms of claudication or pain.
4. Migrating phlebitis.
5. Pulseless vessels.
6. Blanching of the extremities in elevated positions (angle of circulatory efficiency).
7. Rubor in dependent position.
8. Relation of hyperemia phenomena to posture.
9. Slow process, chronic course, keeping in mind that some cases have spontaneous arrest.
10. Absence of simultaneous symmetrical involvement.

Diabetic gangrene is differentiated by the presence of sugar in the urine, hyperglycemia, and other associated signs of diabetes, with gangrene.

Arteriosclerosis is determined by the age of the patient and the condition of the blood vessels in general and evidence of generalized arterial disease not limited to the periphery.

Aneurysm presents a bruit and a history of syphilis or trauma with findings for the same. Serological study is of value here.

Embolic or thrombotic gangrene is associated with a history of infection or heart disease, with sudden onset for the former and a gradual onset from infected foci for the latter.

Luetic endarteritis: serology and associated manifestations of syphilis.

Peripheral nerve injuries with circulatory disturbances are differentiated by presence of motor paralysis or loss of sensation following an injury.

The associated conditions, such as myositis, metatarsalgia, neuritis, pes planus and pes cavus, are differentiated on the basis of symptoms characteristic of these conditions. The most difficult differentiation is in neuritis, especially in the irritative stage, as many of the endarteritis cases have extreme tenderness over the nerve trunks, especially in the distal portions of the extremities, and before occlusion of arteries occurs many of these cases are wrongly diagnosed neuritic.

Any type of foot strain can cause claudication, and this symptom is one that gives considerable trouble in differential diagnosis.

In differentiating thrombo-angiitis obliterans from the angioneuroses, the following points may be of assistance:

Raynaud's disease. The mildest degree of this is local pallor ("local syncope" or "dead finger"), where the affected parts, usually the fingers, less frequently the toes, the edges of the ears, or the tip of the nose, suddenly become cold to the touch and of a waxy white color. Together with this, the patient feels a tingling or peculiar sensation (acroparesthesia). Actual blunting of sensation to touch may be present. One or both hands may be affected, sometimes identical fingers in both hands; the thumb is less often affected than the other digits. The attacks last from a few minutes to several hours and are commonest in winter. They are often brought on by washing the hands in cold water, or by fine digital movements such as in sewing or piano-playing. As the attack passes off, the patient feels a sensation of tingling or even of pain. A more severe variety is that of local asphyxia or cyanosis, in which the affected digits suddenly become discolored, varying in tint from a dusky blue or slate color to an intense purplish-black. Pressure on the discolored area causes a white mark which persists for several seconds, before the lividity slowly reappears. The pain is usually more intense than in local syncope. As the attack passes off, the affected part often sweats freely. But the most severe variety of Raynaud's disease is symmetrical gangrene, which is usually preceded by local asphyxia and sometimes by local syncope. As a rule, the gangrenous process is confined to a small part of the cyanosed area. In its mildest form the necrosis is limited to the epithelium, so that only desquamation results. More often a small blister forms, with blood stained contents. This bursts, leaving an ulcer with subsequent scar tissue. The nails may be lost temporarily, or the necrosis may extend deep into the tissues, forming a dark slough. Whole phalanges may undergo dry mummification and be cast off, leaving a conical stump, with the bones escaping early necrosis. Pain is usually severe during the initial cyanosis.

The symptoms of Raynaud's disease are due to local spasm of the vessels, their sudden onset and disappearance being incompatible with any other hypothesis. The coexistent sensory symptoms are probably due to imperfect blood-supply. A paroxysm of local syncope or cyanosis can usually be relieved, as Cushing has pointed out, by applying a tight flat rubber tourniquet around the limb above, so as to occlude all the vessels, both arteries and veins, and leaving it on for several minutes. When the tourniquet is taken off, there is a temporary vasomotor paralysis, the whole limb flushes to the finger tips, and a wave of redness wipes out the local pallor or cyanosis. In rare cases paroxysmal impairment of vision has been noted, and during such attacks the retinal arteries on ophthalmoscopic examination have been seen to be spasmodically contracted. In paroxysmal hemoglobinuria, Raynaud's syndrome is constantly present, to a greater or less degree.

In striking contrast with Raynaud's disease is the condition known as erythromelalgia, which

usually attacks one or the other foot. There is pain of a burning or stabbing character, often of excruciating severity, occurring in paroxysms, lasting from a few minutes to several hours. This pain is always aggravated by dependent posture of the limb, by voluntary movement, or by warmth, whereas it is diminished by a horizontal or elevated posture, by rest, and by cold applications. The earliest attacks consist simply of pain. As the disease progresses, however, redness and swelling of the foot occur in addition; more rarely, redness precedes pain. The redness is of a bright tint, often confined, for instance, to the ball of the big toe or to small areas of the sole or edge of the foot. Sometimes it is diffused over the foot. The redness increases in intensity, and if the limb be allowed to hang down, the "vascular storm" continues, with bounding arteries, local rise of temperature and intense cutaneous hyperesthesia. As the attack subsides the redness is replaced by cyanosis.

There are other cases in which the vasomotor symptoms are intermediate in type between the two extremes of Raynaud's disease and erythromelalgia. These two diseases may coexist, or may succeed each other in the same patient.

Among soldiers defending sodden trenches in the winter season, as in the World War, there occurred numerous cases of trench-foot. Very few of the cases, however, were due to actual frost. True frost-bite, which is usually the result of intense dry cold, is characterized by sudden, massive tissue-death of the tip of an extremity, whereas trench-foot has a progressive invasion of the tissues, and when it shows gangrene does so in circumscribed patches. The factors producing trench-foot are prolonged exposure of the feet to cold, muck, and thawing snow, want of exercise of the leg muscles, together with prolonged constriction by tight putties and boots which undergo shrinkage when soaked. The signs are primarily vascular in origin, to which may be superadded the sensory phenomena of a peripheral neuritis. The toes become cold and pale, in some cases cyanosed and in rarer cases gangrenous. There is slight impairment of cutaneous sensation in the toes, with considerable pain and tingling. At the outset the peripheral arteries of the feet are tightly contracted, and there is a local rise of blood pressure in the legs, which can be measured with a manometer. The vascular spasm produces local ischemia, with numbness and pain. When the surrounding atmospheric temperature rises, the vessel-walls become relaxed and even paralyzed, so that vascular dilation occurs, with exudation of serum into the tissues through the damaged capillary walls. Thus edema of the feet may supervene, and in severe cases is associated with excoriation and secondary infection of the skin. This edema may extend up to the knees. As the circulation begins to return, the pain becomes aggravated, and even after the circulatory phenomena have apparently recovered, pain may persist, with characteristic signs of peripheral neuritis. This is shown by the combination of impairment of sensation to light touch together with intense hyperesthesia on pressure, so that for weeks the patient may be unable to stand or walk, owing to pain in the soles of the feet, especially anteriorly.

Angio-neurotic edema is differentiated by paroxysmal attacks, lasting a few hours, of sharply defined, localized, hard edema, occurring in the cellular tissues of the face, lips, eyelids, trunk or limbs. The swelling is firm, does not pit on pressure, passes off spontaneously or after the sub-cutaneous injection of adrenalin. It may attack the mucous membranes of the respiratory tract.

Multiple neurotic gangrene of the skin is a dermal process in which vasomotor constriction is not limited solely to the extremities, but to isolated patches of skin. It occurs in hysteria and schizophrenia. The disorder sets in with burning and prickling sensations of the skin and then, after a variable length of time, a few minutes to hours, swelling occurs, and blisters form; later necrosis. At times only a circumscribed edematous bleb occurs.

Scleroderma is a progressive induration of the skin occurring in circumscribed patches. The skin is hard and pigmented. Destructive changes may occur even resulting in periarticular immobilization of joints.

Sclerodactylia, a disease of fingers or toes, allied to scleroderma, occurs in women, and leads to deformity.

Acro-asphyxia is an asphyxia of the extremities of a chronic nature, without other involvement.

Familial gangrene resembles Raynaud's disease somewhat, and the following description by Purves Stewart is classical:

"Three brothers, aged five, four and three years, respectively, in all of whom, one winter, there developed local necrosis of the feet. The oldest child had necrosis of the skin of both heels, followed by similar areas on the dorsum of the right foot and on the fourth left toe. The second child had cyanosis and some necrosis of the dorsal surfaces of both feet, whilst the youngest had severe necrosis of the dorsal surfaces of both feet, of the hallux, fourth and fifth toes on the right side, and a smaller area of necrosis on the plantar surface of the left hallux."

In working up our group of cases we have used a modification of the data sheet proposed by the Mayo Clinic and the cases have been reviewed under the following headings: Name, age, sex, nationality and birthplace, family history of vascular disease, smoking habits, past diseases, precipitating factors and claudication,—location and severity of rest pain and how it is relieved, the presence or absence of color changes followed by a summary of progression, including vasomotor disturbances whether local or general, whether accompanied by phlebitis, thrombosis, ulcers or gangrene. Prior treatment, prior diagnosis and a chronological history of surgical procedures were noted.

The following diagnostic points were stressed in our examinations: Palpation of the main arteries of the legs and arms, graded on the basis of four. The observation of dependent rubor, elevated pallor and edema was made and noted. Gangrene, if present, was, of course, noted. Attempts were made to produce claudication and rest pain. In some cases hot and cold water tests were used. The temperature of the extremities was noted as compared with the normal skin temperature. In all cases recently under our observation we have used a test which we have termed the Allen Test in which (after a blanching has been produced in the elevated position) and one or the other of the large vessels to the extremity is blocked off by digital pressure, the extremity is lowered and an observation of the collateral circulation is made.

Every patient had routine physical and laboratory examinations and such special examinations as seemed indicated.

A review of the pathological files of the hospital, including the out-patient clinical material for the past ten years, shows sixty-three cases of circulatory disturbance in the extremities, of which fifty-two have been classified as thromboangiitis or endarteritis obliterans. We have not included in this list any cases of frank arteriosclerosis or luetic endarteritis, although there are some of the cases diagnosed endarteritis which have been placed in discard because of the possible presence of more obvious conditions. These cases constitute eleven which are diagnosed as follows:

Raynaud's—2.
Epidermophyton—1.
Diabetic Arteriosclerosis—3.
Trench Frostbite with a Healed Amputation—1.
Circinoid Aneurism of the Radial Artery Followed by Amputation—1.
Arteriosclerosis with Diagnosis of Thromboangiitis Obliterans—2.
Sciatic Nerve Injury with Ulcer and Amputation—1.

A brief summary of the remaining 52 cases follows:

Ages at onset range from 19 to 38 years with one case each of 51 and 60 years of age. Duration of disease ranges from two to twelve years (average duration eight years and nine months).

Nationalty:	Jewish	14
	Celtic	20
	German	8
	Scandinavian	6
	Latin	3
	Undetermined	1
		52
Smokers:	Mild	1
	Moderate	23
	Excessive	12
	Non-smokers	8
	Unknown	8
		52

POSSIBLE ETIOLOGICAL FACTORS

Exposure in service, foot and leg strain	4
Trench warfare associated with severe exposure to the elements	22
Cold	6
No service exposure	14
Dental caries	19
Rheumatic infections of various types	13
Nose and throat infections	14
Pulmonary infections, including tuberculosis	12
Prostatitis	9
Amebiasis and other gastro-intestinal infections	10
Typhoid	2
Hypertension	1
Acoholism	1

Positive blood Wassermanns were found in five cases, in four of which, despite progression of endarteritis symptoms, all serological tests were negative for the past year after intensive treatment.

As evidence of the difficulty in diagnosing these conditions, which difficulty was pointed out

earlier in this paper, it is interesting to review some of the earlier diagnoses which these cases carried:

Pes planus	19
Circulatory disturbances	8
Metatarsalgia	8
Varicose veins	3
Rheumatism	7
Neuritis	5
Raynaud's disease	6
Myositis	1
Trench feet	5
Acrocyanosis	1
Luetic endarteritis	3
Tuberculosis of the bone	1

The type of progression in these cases is interesting from a standpoint of prognosis.

Forty of the series could be classified as slow progression, two as sudden and ten as recurrent with severe manifestations. Thirty-nine cases presented a history of claudication classified as: none mild, twenty-two moderate, and eight severe. Rest pain was present in thirty-four cases. Easy fatigue was present in forty-two cases. Color changes were present in forty-one cases. Thrombosis of the main arteries was present in fourteen cases, not all of which required surgical interference, and phlebitis was present in twelve cases. Gangrene was present in seventeen cases, classified as: Ulcers—7; moderate gangrene, that is, of the toes—5; severe gangrene—5.

Simple amputations were done in two cases and repeated amputations were done in twelve cases. Two cases had peri-arterial sympathectomy, one followed by amputation later; the other done a year ago and not traced. Three cases are included in this series on an old diagnosis on which we have no recent data. Two have had ganglionectomy with some relief of pain. All cases with mild and moderate symptoms have had various forms of physiotherapy and repeated courses of intravenous typhoid vaccine. What do the above facts indicate, but that the condition is being recognized early, that it is much more insidious and slower than usually thought to be, and that conservative measures have proven of some palliation in those cases of slow progression?

Whereas, many of our patients have been given treatment of various kinds, notably the relief of abnormal static demands by orthopedic measures, physiotherapy, Bier's hyperemia, and postural exercise, the clinic facilities, until recently, were such that typhoid therapy and tests of the vasomotor index could not be done routinely. These are finer methods occasionally necessary for diagnosis and the evaluation of cases suitable for lumbar sympathectomy.

CONCLUSIONS

1. The differential diagnosis of circulatory disturbances of the extremities calls for most careful examination and evaluation of findings.
2. Thrombo-angiitis obliterans can and should be recognized early.
3. Our series demonstrates no specific etiology, but strongly suggests lowered local resistance following exposure, with superimposed infection.
4. There are at present no criteria on which prognosis can be based. Most cases are slowly progressive, but may be subject to sudden severe flareups.
5. Treatment of the mild cases should be palliative. Surgery offers the only relief in severe cases.
6. No conclusions are made regarding foreign protein therapy, except that it offers temporary palliation.

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SKIN TESTS IN CHRONIC ULCERATIVE COLITIS*

J. C. Thomas Rogers, M.D., and J. Arnold Bargen, M.D.,
Rochester, Minnesota

THE value of intradermal injections in the study of certain infectious diseases has been generally accepted. Rosenow has suggested the importance of skin tests in various infectious diseases.

Local reactions from such procedures have been noted to vary as individual resistance has changed, either from active or passive causes, or in accordance with a person's native immunity to infection. The work of the Dicks excellently illustrated this feature.

Since the early studies of Koch and von Pirquet, cutaneous reactions in tuberculosis have become common knowledge. Here is, in addition to the phenomenon of immunity, the often superimposed one of allergy. Because of the intimacy with which the two are associated in this particular instance, there is a general tendency to think of the two conditions as synonymous. However, this is not a true conception, as has been definitely proved by Rich and his collaborators. He stated "acute inflammation is a protective mechanism, but it does not follow that an enhanced capacity for reacting with inflammation (allergy) is always necessary for protection."

Dorst and Morris for several years have been interested in skin tests and their use in explaining the clinical pictures of spastic or irritable colon and mucous colitis on the basis of hypersensitivity of the enteric tract to certain bacteria. They have noted very encouraging results from desensitization with autogenous vaccines made from cultures of organisms which were obtained from the stool, and which gave positive allergic skin reactions.

Anaphylaxis may be present in the development of immunity in infectious disease, but not necessarily so. Yessner has shown that in experimental sporotrichosis allergy develops, but rapidly disappears, and that the animal then enjoys perfect acquired immunity.

It is not within the scope of this study to attempt to determine the relationship of allergy to immunity. Our particular interest lies in the problem of immunity in chronic ulcerative colitis, and although hypersensitivity at times has been an early, more or less prominent factor, results of skin tests applied to persons afflicted with this disease have been such that certain deductions have been warranted.

The antigens used for the intradermal injections were prepared by Rosenow, and represented a suspension of 200,000,000 organisms for each cubic centimeter of physiologic sodium chloride solution, preserved with 0.2 per cent phenol. As many as fifteen different antigens were injected into a single patient, but the antigens in which we were particularly interested were those of the diplostreptococcus of chronic ulcerative colitis and two other organisms found in cultures of material from the rectum and sigmoid; namely, Streptococcus fæcalis, and enterococcus. The last two were included because of their similarity to organisms of chronic ulcerative colitis. The three organisms, although similar, exhibit strikingly different characteristics. Not only do they have different cultural characteristics, but, as Zozaya has demonstrated, from each a specific polysaccharide can be isolated.

The injections of 0.05 c.c. of each antigen were made intradermally, on the volar surface of the forearm, and readings were made at various intervals following injection, but the most satis-

*Dr. J. C. Thomas Rogers, Fellow in Surgery, The Mayo Foundation, and Dr. J. Arnold Bargen, Division of Medicine, The Mayo Clinic, Rochester, Minnesota. Read before the Central Society for Clinical Research, Chicago, Illinois, November 22, 1931.

factory interval was found to be twenty-four hours. Rarely did a typical allergic reaction occur, and when present was noted within thirty minutes after injection of the antigen.

Absence of, or merely slight, redness surrounding the needle puncture was recorded as negative. The reactions were graded. Redness, and a variable but usually slight swelling, limited to the blistered area, up to 0.5 cm. in diameter, was graded 1; a reaction from 0.5 to 1 cm. in diameter was graded 2; a reaction from 1 to 2 cm. in diameter was graded 3, and a reaction 2 cm. or more in diameter was graded 4 (Fig. 1).

In the course of three months, fifty-seven patients who had the clinical and laboratory manifestations of chronic ulcerative colitis were given injections. Seven of these patients were in the second decade of life; twenty in the third; fifteen in the fourth; eight in the fifth and five in the sixth or a later decade. In accordance with the figures of others, and our own, the ages at which the disease is most prevalent are between twenty and forty years. In this group there was no attempt whatever at selection of cases because of any clinical factors of age, sex, or laboratory findings other than those consistent with correct diagnosis. For example, patients who had as many as twenty bloody rectal discharges daily, anemia (hemoglobin as low as 22 per cent), and symptoms for as long as seventeen years were observed in turn, just as those who had only three or four stools daily, no demonstrable anemia, and a year or less of trouble. There were thirty-two males and twenty-five females.

As many patients as possible were tested before treatment with antibody globulin solution. In this treatment, the initial dose of 0.1 c.c. was increased by 0.2 c.c. daily until the usual maximal amount of 3 c.c. for each injection was attained. Occasionally, the local and general reactions of the patients required some modification of this routine, making it necessary to proceed more slowly. Skin tests were again made after a series of such injections, frequently at the time of dismissal.

For comparison, ten healthy persons between the ages of twenty and fifty years were tested. The diplostreptococcus of chronic ulcerative colitis, the Streptococcus fæcalis and the enterococcus, in the usual concentrations, were used as antigens. A control of 0.2 per cent phenol in sodium chloride solution was used in each instance. The reactions were graded as follows: in two cases, grade 2; in five cases, grade 3, and in three cases, grade 4.

All patients who had chronic ulcerative colitis, with the exception of seven, exhibited local skin reactions, of varying intensity, to the diplostreptococcus of chronic ulcerative colitis, or to Streptococcus fæcalis, or to the enterococcus or to all. The seven patients were those who gave no local reactions whatever to the antigens mentioned, and will be referred to later. The skin reactions of the remaining forty-nine patients were not constantly commensurate with the gravity of the disease. Such factors as anemia, number of stools, fever, duration of disease, or remote previous treatment showed no constant tendencies to modify the reactions in any way.

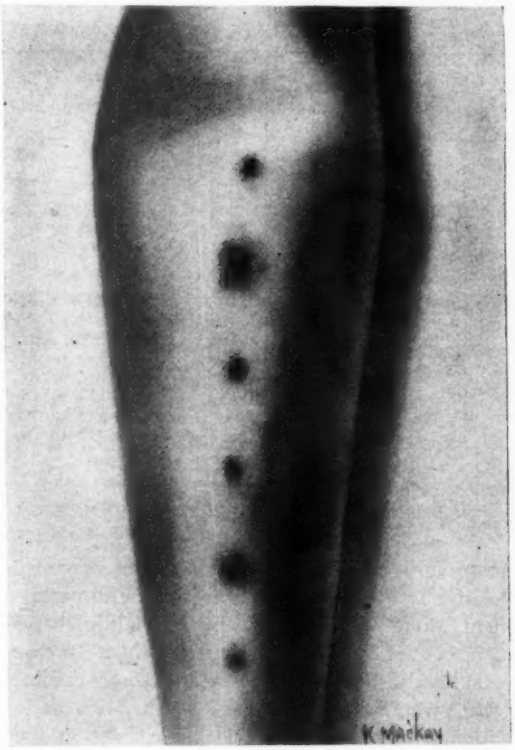

Fig. 1. The size and extent of the wheal after intradermal injection of the organism to which the patient was sensitive.

It was possible to follow the twelve cases noted in the table more closely than the others.

Of these twelve cases, in every instance in which the skin tests were negative following treatment, after there had been a positive reac-

tion before treatment, there was unquestionably definite and marked improvement in the patient's condition. The intensity of the preliminary test gave no indication of the possibility of later negative reactions.

If, after a course of treatment usually adequate for good results, the skin tests remained positive to a degree similar to that before treatment, there was little if any clinical improvement. Cases 3, 11 and 12 illustrate this. In case 3, antibody globulin solution and some vaccine were given over a period of seventy-two days, without there being appreciable change in the clinical condition, and with no change in the cutaneous reaction. The interesting feature about Case 12 was that the patient began to show encouraging signs of improvement for three weeks after entrance to the clinic, and until she underwent tonsillectomy. This episode caused a severe flare-up of the colitis and at the same time the skin tests became positive, but with less intensity of reaction than formerly. Cultures from this patient's tonsils reproduced most severe ulcerative colitis in rabbits. In Case 11 there were marked initial reactions, graded 4; treatment for three weeks caused no change in clinical condition or skin tests. Recent correspondence with this patient disclosed that she was continuing to do poorly.

The patient in Case 9 did very well on his first visit to the clinic. His skin tests were negative before he received any serum whatever. But after an absence of seventy-nine days, he returned with an exacerbation of the old condition, probably incited by a local infection about the anus. At this later time, skin tests were definitely positive, graded 2.

The number of days of treatment between the original skin tests and the second tests varied (table). In Case 5 there was unusual improvement in eleven days, at which time skin tests were negative. On the other hand, in Case 6, forty-eight days of treatment were required before clinical cure supervened.

It is possible that the skin tests in many instances were actually negative long before a second test was done. Instead of doing frequent tests on these patients as treatment continued, and possibly stopping administration of antibody globulin solution as soon as the tests became negative, we did our second tests when the patient had made definite improvement or had shown little if any tendency toward betterment.

Of the original fifty-six cases, the initial cutaneous reactions were negative in seven. The first of these patients had had full doses of antibody globulin solution for four weeks before the initial test; the condition was excellent at the time of the test. The second patient had had full doses of antibody globulin solution for four weeks before the tests; the condition was improved markedly at the time of the tests. The third patient had had no treatment with antibody globulin solution, but had had three years' rest in bed;

RESULTS OF TREATMENT WITH ANTIBODY GLOBULIN SOLUTION

Case	Reaction before treatment, grade	Duration of treatment, days	Reaction after treatment, grade	Hospitalized	Stools, daily	Hemoglobin, per cent	Duration of disease, years	Progress
1	1	42	0	No	6 to 8	65	4	Clinical cure
2	3	30	0	Yes	7 to 8	60	3	Clinical cure
3	2	72	2	Yes	7 to 10	47	1.5	No improvement
4	2	24	1	No		64	4	Improved
5	2	11	0	No	20 or more	72	5	Clinical cure
6	2	48	0	Yes	20	22	2.5	Clinical cure
7	3	17	0	No	6 or more	56	3	Markedly improved
8	2	28	0	No	6 to 8	77	8	Markedly improved
9	0	33	2*	Yes	4 to 6	54	3	Markedly improved
10	1	25	0	No	10 to 12	81	13	Markedly improved
11	4	21	4	No	5 to 6	76	1.5	No improvement
12	3	27	2	Yes	15 to 20	44	8	Flare-up with tonsillectomy at second test; doing well up to that time

*Test made on patient's return, after seventy-nine days at home, during which time he had mild exacerbation of his trouble associated with perirectal abscess.

the condition in the bowel was well localized. The fourth patient had received antibody globulin solution and vaccine on previous visits to the clinic, and returned merely for re-examination, in very good condition. The fifth patient had received vaccine elsewhere, and, although markedly improved, came to the clinic for evaluation of the condition; the general condition was very good. The sixth patient had received antibody globulin solution on previous visits and vaccine at home; the condition was very good. The seventh patient had received antibody globulin solution and vaccine previously, with excellent results.

The third patient is represented as Case 9 in the table.

The clinician finds it difficult to evaluate individual resistance to the infection in chronic ulcerative colitis. The mental attitude of the patient is capable of markedly changing the picture. Now, if it is possible to estimate by a series of innocuous skin tests how the case is progressing, an important step in the standardization of the treatment of chronic ulcerative colitis has been taken.

It is easily seen (table) that the tests become negative in some cases sooner than in others. In other words, there is undoubtedly individual variation in the protective qualities, and the amount of antibody globulin solution necessary to bring about general clinical improvement in one case may be entirely inadequate in another. The question naturally arises as to the feasibility of controlling the amount of antibody globulin solution to be given, by means of skin reactions.

This study furnishes additional data supporting our contention that the disease is of specific etiology. If a substance such as the antibody globulin solution is introduced in the treatment of these patients, and there is consequent complete negation of skin reactions, the substance appears to be a specific agent. Administration of this antibody globulin solution seemingly has been the chief factor in effecting increased resistance and clinical betterment in the cases observed. It is to be hoped that this study may lead to a more definite prediction of the length of time over which a patient should receive specific treatment.

In two cases, now to be reported, the effect of treatment and the results of skin tests were as nearly opposite as could be.

Case 1.—A married man, aged twenty-eight years, had had no intestinal trouble of any kind until May, 1924, when he had diarrhea of rather sudden onset. At first there were only two to three loose stools daily, with occasional streaks of blood. The number of stools increased in frequency until, at the time he entered the clinic in August, 1930, he had five to eight soft, bloody discharges daily. Between the time of onset and August, 1930, more than seven years, many forms of treatment, including a vaccine made from organisms cultured from his stools, had been tried without beneficial results.

The patient was fairly well nourished, and was able to be up and about. Physical examination was negative except that a tender, rope-like mass was palpable in the left lower abdominal quadrant. The mucosa of the rectum and sigmoid was glazed and granular. Bleeding occurred with slight trauma. The lumen had become contracted, losing about a third of its usual diameter. The concentration of hemoglobin was 60 per cent, erythrocytes numbered 4,220,000, and leukocytes 7,600 in each cubic millimeter of blood. Diplostreptococci of ulcerative colitis were isolated from cultures of the rectal mucosa, and the roentgen diagnosis was chronic ulcerative colitis involving the entire colon, apparently active. In spite of these observations, the patient decided to go home without treatment. At home he continued to have five to six stools daily until a few months before he reëntered the clinic, when their number increased to about ten daily, and his ability to control them decreased.

May 25, 1931, the patient registered at the clinic again. At this time he was noticeably pale and weak, and showed evidence of recent loss of weight. May 27, 1931, he weighed 106 pounds. Antibody globulin solution, 0.1 c.c., was given intramuscularly. The amount of antibody globulin solution was increased by 0.2 c.c. daily until he was getting about 3 c.c. By June 12 his weight had increased to 113.5 pounds, the number of stools had decreased to as few as three in twenty-four hours, and his strength had increased remarkably. Intradermal tests were made before treatment was begun, and the reaction was graded 3. After thirty days of treatment the skin tests were all negative and the patient was ready to go home in very good condition.

In those cases in which treatment has accomplished little if anything, the skin tests have continued positive. To try to explain why the antibody globulin solution does not give complete relief to all is not within the scope of this paper. However, it is suggested that the ulceration and destruction present, irrespective of the infection, might account for any failure. If the skin tests continue positive after a thorough course of treatment, the question arises if improvement can come from prolonging the injections of antibody globulin solution. This study suggests a negative answer to this query. However, further ob-

servations and follow-up studies will be necessary before the answer can be definite.

Case 2.—A single man, aged twenty-two years, came under our observation May 25, 1931. In August, 1929, the patient first noticed blood and mucus in the stools; this continued for three days. A similar episode occurred in October, 1929. In February, 1930, he passed eight or more bloody stools daily. Since that time he had been miserable with abdominal cramps, weakness, and bloody rectal discharges. He was in the hospital five weeks, without improvement, before he came to the clinic.

There was a palpable, tender, cord-like mass in the lower left abdominal quadrant, which seemed to be the descending colon. On sigmoidoscopic examination, the mucosa of the rectum and sigmoid was granular, glazed, and bleeding. The lumen was contracted, so that about two-thirds of its normal diameter remained. Roentgenograms of the colon gave evidence of chronic ulcerative colitis involving the bowel distal to the hepatic flexure, with considerable shortening and narrowing. The concentration of hemoglobin was 47 per cent; erythrocytes numbered 4,170,000 and leukocytes 11,900 in each cubic millimeter of blood. The Wassermann reaction of the blood was negative. For seventy-two days the patient received the usual antibody globulin solution to the extent of his toleration. He was given most careful attention, and such adjuncts as blood transfusion, special diets, small amounts of vaccine, and preparations of iron compounds availed nothing in the way of improvement. At the end of this period of treatment this patient's skin tests were positive to the same degree as at the beginning.

The fact that in Case 9 (table) there originally was a negative skin reaction, and that the patient went home in good condition only to return seventy-nine days later, in trouble from ulcerative colitis, and with skin tests positive, allows an interesting speculation. If this patient makes progress clinically, we would expect the intracutaneous tests to become negative a second time. The controls demonstrated only that the average person gives a definitely positive skin reaction to the antigens.

SUMMARY AND CONCLUSIONS

We have studied the skin reactions of fifty-six patients with chronic ulcerative colitis after intradermal injections of antigens prepared from cultures of organisms isolated from the rectal mucosa of patients with the disease. The skin reactions of ten normal adults, using the same antigens, have been observed. As the condition of patients who had given positive skin tests improved, their skin tests became negative or decreased in intensity of reaction. This survey establishes the antibody globulin solution more strongly as a specific therapeutic agent in chronic ulcerative colitis. Employment of similar antigens for skin tests may give valuable aid in carrying on the treatment of patients with chronic ulcerative colitis.

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OBSTRUCTIVE JAUNDICE FROM A SURGICAL STANDPOINT*

WALTMAN WALTERS, M.D.
Rochester, Minnesota

IN discussion of the treatment of patients with obstructive jaundice, of outstanding importance are the following points: The differential diagnosis between lesions within the liver and those without; the determination of the propitious time for operation; the correlation between the patient's symptoms and operative findings; the estimation of satisfactory postoperative progress, and finally the recognition of certain procedures of value in the treatment of postoperative complications.

DIFFERENTIAL DIAGNOSIS

From the standpoint of differential diagnosis, biliary colic followed by jaundice, with or without associated chills and fever, is indicative of intermittent obstruction to the passage of bile from the liver to the intestines. This is true whether the cause of the obstruction is stone in the common or hepatic ducts, tumor in the head of the pancreas, or stricture. When the jaundice is painless, the possibility of the lesion being intrahepatic must be considered. The distinction between intrahepatic obstruction and obstruction due to a tumor in the head of the pancreas in some cases is difficult. Broadly speaking, the appearance of jaundice without pain, affecting a patient whose stools contain bile, or from whom bile is obtained by duodenal tube, and whose gallbladder is not palpable or distended, is most likely to be the result of an intrahepatic lesion. Should the jaundice be constant and bile absent from duodenal content or stools, regardless of whether a distended gallbladder can be felt through the abdominal wall, the lesion is likely to be pancreatic.

In a study of patients operated on at the clinic for carcinoma of the head of the pancreas, producing obstructive jaundice, it was discovered that a distended gallbladder was palpated through the abdominal wall in only half of the cases. In a small group (approximately 5 per cent) a stone may exist in the common or hepatic bile duct, without causing pain. The corollary of this is that when the condition of the patient is such that abdominal exploration can be carried on with reasonable safety, the patient should be given the benefit of such a procedure. No one is infallible in the differential diagnosis of obstructive jaundice. The diagnosis is always so difficult, and the chance of saving a life so important, that, however positive the evidence of malignancy, operation is advised in all cases when the general condition permits.

PROPITIOUS TIME FOR OPERATION

In determining the propitious time for operation, an attempt should be made, in the preoperative diagnosis, to determine the situation of the lesion, for if the history is one of intermittent obstruction in which pain has played an important part, there is the possibility that the jaundice will decrease, making the patient a better operative risk.

The patient whose blood requires longer than nine minutes to coagulate constitutes an increased operative risk that is due not only to the tendency to bleed, but also to the probably more than usual injury to the hepatic cells. I have been of the opinion for some time that the relation of hepatic injury to an abnormally elevated coagulation time was a significant feature in jaundiced patients. In most instances, intravenous injection of such a hemostatic substance as calcium chloride, or of glucose, or transfusion of blood, suffices to lower a prolonged coagulation time to within normal limits, even though, in some cases, such reduction is sustained for a period of only a few hours. Should this be the case, one should govern the interval between the transfusion and the operation accordingly.

With the history of painless jaundice, and an abnormally prolonged coagulation time, one is more hesitant about carrying out an operative procedure than if, from the history, one would be led to believe that the obstruction was the result of stone. In such cases a period of delay,

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even though it necessitates allowing the patient to return home, will often suffice to clarify the diagnosis and present exact indications for exploration.

Of jaundiced patients, renal function always should be determined, for not infrequently it is abnormally decreased. Preoperative study of the blood urea of a patient who was recently operated on revealed accumulation of 150 mg. in each 100 c.c. The value for urea decreased rapidly, with improvement in renal function, under eliminative procedures such as intravenous injections of hypertonic solutions of glucose, drastic catharsis, and hot packs, to the extent that successful cholecystectomy, with removal of stones, and choledochostomy were carried out, in spite of the fact that the patient was seventy-five years of age.

It is worth while dwelling on the influence of age as a factor in operative mortality. On other occasions, I have emphasized the fact that it is the patient's general condition and not his age which is one of the determining factors in operative mortality, substantiating this argument by presentation of several patients between the ages of sixty-nine and eighty years, on whom I have successfully performed extensive gastric resection for carcinoma. A similar ability of elderly patients to withstand operations on the gallbladder and common bile duct, even when accompanied by jaundice, is apparent. Certainly when male patients aged from seventy-five to eighty-five years, in satisfactory condition, are able to withstand prostatectomy, it would seem that there would be no reason why an intra-abdominal operation should be looked on with any greater hesitation.

The presence of purpuric spots on the skin of jaundiced patients has been regarded by some as a danger signal, which should not be passed without pause. Although I am not able at present to present the exact statistics, I am rather of the opinion that their presence as indications of greatly increased operative risk has been overemphasized. Their presence often has been noted in jaundiced patients whose coagulation time has been within normal limits, and whose postoperative course has been uneventful. I do not recall a single patient with such purpuric spots who has been denied operation, unless, for other reasons, operation was obviously unwise at the time it was considered.

THE SIGNIFICANT FEATURES IN THE OPERATIVE FINDINGS ADEQUATELY EXPLAINING THE TYPE OF BILIARY OBSTRUCTION

Satisfactory results in surgical treatment of jaundiced patients depend on adequate and complete relief of the obstruction. For purposes of this discussion, the obstructions can be limited to stones in the common and hepatic bile ducts, strictures, tumors of the pancreas and of the ampulla of Vater, and finally the obstruction seen in that group of cases of subacute cholecystitis in which the jaundice is apparently the result of associated cholangeitis and pancreatitis.

The appearance of the gallbladder and the common bile duct.—When the obstruction is inflammatory in origin, whether secondary to stones or stricture, the walls of the gallbladder are thickened and its color usually is changed from the normal bluish-green to a cream. When the obstruction of the common bile duct is pancreatic in type, the color of neither the gallbladder nor of the common bile duct is changed, unless there is an associated infection, with cholelithiasis, which occurs but rarely. With the wall of the gallbladder showing signs of inflammation, with stones absent as far as palpation reveals, and with jaundice present, the probabilities are that a stone is present in the common or the hepatic duct. Such stones denote their presence by thickening and change in color of the walls of the common bile duct and increase in its caliber. Many stones in the common duct can be palpated, but stones in the ampulla are frequently overlooked unless the duct is opened and carefully explored with probe and scoop. Even then, the scoop or probe may slip by a small stone nestling in the ampulla, and it is always advisable to palpate the duct with scoop or probe in it, which makes a small stone more prominent. Wherever the size of the duct permits, it is of value to use the little finger as a probe, inserting it in both directions of the duct, to make sure that a stone is not being overlooked. When stones have been removed from the common or hepatic duct, it is my custom to see to it that a probe or scoop of large size can be passed through the lower end of the ampulla into the duodenum, thus being certain that obstruction has been relieved, and at the same time accomplishing sufficient dilatation of the ampulla so that a stone, smaller in diameter than that of the scoop, can pass spontaneously into the duodenum.

When the gallbladder shows evidence of subacute inflammation and a mild degree of jaundice is present, when the common bile duct is normal in size and no stones are apparent to the one who is exploring with the scoop, the probabilities are that the associated cholangeitis and pancreatitis have been the causes of the mild degree of jaundice. Such explanation, however, should be accepted only after the most thorough and painstaking search of the tract for stones. Failure of jaundiced patients to recover when stones of the common and hepatic ducts have been present, is, in most instances, due to the fact that stones in the duct have been overlooked and have later dropped down, to produce an obstruction which is increased to the extent that hepatic and renal insufficiency occur.

Tumors of the head of the pancreas.—The head of the pancreas, as well as its body, should be palpated as a part of the examination of the biliary passages. With a mass in the head of the pancreas, and distention and normal color of the common bile duct and gallbladder, the obstruction is most surely one of the pancreatic portion of the common bile duct. In approximately 33 per cent of cases the lower end of the common bile duct passed posterior to the pancreas rather than through it, and in this minor group of cases, a tumor in the head of the pancreas does not produce jaundice until late. With a tumor in the head of the pancreas, the differential diagnosis of a malignant lesion and a benign one can be accurately made only by removal of a specimen for microscopic diagnosis. This usually is inadvisable because of the risk of such procedures, and because of the fact that a surgical procedure, in either instance, should be directed to relief of the obstruction and not to attack on the lesion itself. Study of the progress of patients following relief of obstructions due to tumors in the head of the pancreas indicates that approximately 15 per cent of the obstructions were the result of inflammatory changes. This should strike an optimistic note in a discussion of the lesion with the patient or his relatives. If the lesion is inflammatory, relief of the obstruction is followed by lasting good results. Even though the lesion is malignant, jaundice and itching are relieved by anastomosis of the biliary channels and the intestine, and the patient is able to enjoy months and frequently years of comfort. The malignant tumor in the head of the pancreas grows slowly, but in its later stages may produce sufficient deformity of the duodenum to interfere with the passage of gastric and duodenal content. In such cases, provided the patient's condition permits, gastrojejunostomy as a palliative procedure will still further prolong his life.

Condition of the duodenum.—The possibility of a large, perforating ulcer on the posterior wall of the duodenum, penetrating the pancreas and producing obstruction of the common bile duct by extension of the inflammation to surrounding structures should be remembered as a possible cause of biliary obstruction. Such a lesion is likely to be overlooked, due to its low position in the duodenum and the difficulty of its visualization in roentgenologic examination. This is particularly true if the patient has been operated on previously for disease of the gallbladder. A history of intermittent pain in the right upper quadrant of the abdomen, and the finding of a normal appearing common bile duct should immediately call attention to the possibility of such a duodenal lesion.

Tumors of the ampulla of Vater.—Such tumors, although they occur relatively infrequently, produce in general a painless type of jaundice, or, if the lesion becomes ulcerating, may be the source of severe intestinal hemorrhage. Since it is a relatively rare condition, it is more likely to be overlooked. In a recent case in which I successfully resected the ampulla and the posterior wall of the duodenum, with simultaneous anastomosis of the common bile duct to the duodenum, the carcinomatous lesion was small and of low degree of malignancy (adenocarcinoma graded 2). The small size of these lesions, their low degree of malignancy, their tendency to produce biliary obstruction with jaundice early and metastasis late, make early diagnosis and localization of the lesion important, and its surgical removal valuable.

MEASURES DIRECTED TOWARD RELIEF OF THE OBSTRUCTION

Following removal of stones from the common bile duct, the opening of the duct is sewed around a catheter, and this is left in place for approximately twelve days. The reason for this is that there is a probability that subsequent to the manipulation of the interior of the duct with a scoop sufficient edema or hemorrhage might produce temporary obstruction, and interfere

with the patient's recovery. The catheter, therefore, serves as a safety valve. When there is associated hepatitis and pancreatitis, particularly in that group of cases in which the jaundice has not been accompanied by stone in the common or hepatic duct, prolonged drainage of the duct, for six to eight weeks or longer, is advisable. Such being the case, drainage is better accomplished by means of a small T-tube than by a catheter. A rubber tube or catheter should never be placed completely within the duct without its distal portion projecting through the papilla of Vater into the duodenum. With such projection through the papilla of Vater into the duodenum, intestinal peristalsis usually will pull the catheter completely into the lumen of the intestine, from whence it is spontaneously evacuated with the movement of the bowels. On the other hand, the ampulla or papilla of Vater would serve as a too effective barrier to passage of a piece of tube placed entirely within the duct. On one occasion, I removed such a tube, which a surgeon in another city had inserted into the duct two years previously; it was encrusted with bile salts.

Strictures.—When sufficient normal duct remains above the stricture to make possible accurate anastomosis of the remaining portion of an opening made in the duodenum, permanently good results can be expected, unless there is associated cholangeitis or hepatitis. In a group of patients whom I operated on for stricture of the common or hepatic bile duct, in thirteen of whom sufficient duct remained above the stricture into the duodenum to enable it to be anastomosed accurately to an opening in the duodenum, eight patients have had no further evidence of disease of the biliary tract, neither colic, jaundice, nor chills and fever. In several of these cases, more than four years have elapsed since operation. When the stricture is at the juncture of the common and hepatic ducts, and insufficient duct remains for accurate anastomosis to the duodenum, occasional good results are obtained by excision of the stricture, with direct anastomosis of the ends of the duct. It must be ascertained, of course, that the distal portion of the duct is patent. Although this type of operation for stricture has not been in particular favor, due probably to the fact that, associated with the stricture, sufficient infection remained in the duct so that partial contracture of the anastomosis probably occurred, with recurrence of symptoms of incomplete obstruction, mild, however, in degree. When the stricture is complete, and involves the common and hepatic ducts, establishment of an external biliary fistula, which later can be coned out and transplanted into the duodenum, has given very satisfactory results. Last year, I reported five such cases in which I had operated, in three of which excellent results had been obtained.

If a patient presents himself with an external biliary fistula, having been operated on elsewhere, before considering transplantation of the fistula the condition of the common and hepatic ducts and gallbladder must be ascertained. For example, if an egg-white material is excreted, the probabilities are that the gallbladder remains and that there is a stone in the cystic duct. When bile is excreted, the probabilities are that the obstruction is in the common bile duct, and that it is due either to stone, stricture, or tumor of the pancreas. If transplantation of an external biliary fistula is deemed the procedure of choice, it must adequately drain the intrahepatic ducts, and the latter must be free from stones; otherwise, the obstruction will recur. Furthermore, the possibility of a more certainly curative type of operative procedure, namely, hepaticoduodenostomy, should be considered if sufficient normal duct remains above the stricture or the fistula to enable the duct to be accurately anastomosed to the duodenum.

When a tumor in the head of the pancreas is the cause of the biliary obstruction, cholecystenterostomy relieves the jaundice and prolongs the patient's life, in a satisfactory manner, for from fourteen to forty-eight months. When the condition of the patient is such that the operation can be carried out as a primary procedure, in one stage, such is the preferable procedure. On the other hand, if patients are in unsatisfactory general condition, there is a field for the operation in two stages in which biliary drainage by cholecystostomy is first established, with improvement in the function of the liver and kidneys and in the patient's general condition. Ten or twelve days later, the second stage of the operation can be carried out, at which time the gallbladder can be anastomosed to the stomach or duodenum. These methods were used last year at the clinic in ten cases of cholecystenterostomy for tumors in the head of the

pancreas with obstructive jaundice, with recovery in nine. An equal number of patients were operated on the previous year with similar results. It should not be forgotten that in a consideration of cholecystenterostomy as a procedure of value, in pancreatic obstruction of the common duct, the patient, in addition, has received the benefit of exploration of the biliary passages, eliminating the possibility of a so-called silent stone of the common duct.

INDICATIONS OF SATISFACTORY POSTOPERATIVE PROGRESS

The most certain indication of satisfactory progress subsequent to operation is the general appearance of the patient, his feeling of well-being, a normal output of bile and of urine of normal color, and temperature and pulse rate within normal limits. From 150 to 400 c.c. of bile of normal color excreted in each period of twenty-four hours, is satisfactory evidence that hepatic function is normal. Should blood appear in the bile, one must be alert to prevent it from clotting in the tube or in the duct, producing secondary obstruction. If, in association with bleeding from the wound, there is blood in the bile, the situation should be regarded as of considerable seriousness, and transfusion of blood given immediately and again as often as necessary. Should the bleeding continue, one should unhesitatingly open the incision, carry out exploration of the operative field to determine the site of the bleeding if possible, and control it. In a recent case, following removal of stones from the common bile duct and the gallbladder, secondary hemorrhage occurred, necessitating reopening of the incision on two occasions. On the former occasion, the operation was done in the patient's room and on the latter, in the operating room; the second time, it seemed likely that the patient might expire while the exploration was being carried out. The point of origin of the bleeding was identified, and the bleeding controlled; the blood clots which had accumulated above the liver, depressing and twisting it, interfering thereby with the circulation in the inferior vena cava, were evacuated and the patient recovered. Similar depression of the liver occurred four years ago in a case in which operation had been performed for stricture of the common bile duct; the depression occurred from leakage of bile. After the incision had been opened in the patient's room on the night of the operation, bile gushed from above the liver. This discharge was followed by a fairly rapid decrease in pulse rate from 160 to within normal limits. The respiratory rate decreased from 36 to normal, and the patient made a satisfactory recovery.

Studies of renal function, of the degree of jaundice, and of the coagulability of the blood should be carried out subsequent to operation. With the decrease in the amount of bile in the blood, there is no question that the obstruction has been adequately relieved. Should the coagulation time be increased, measures directed to its decrease should be considered. An intake of fluid of 2,500 to 3,000 c.c. daily should be insisted on. A portion of this fluid can be taken satisfactorily by proctoclysis in the first few days of convalescence, when the patient is unable to tolerate any considerable quantity of fluid by mouth. The use of physiologic solution of sodium chloride given subcutaneously or intravenously twice daily in a quantity of 1,000 c.c. use of a 10 per cent solution of glucose in physiologic solution of sodium chloride, given intravenously twice daily in a quantity of 1,000 c.c. at each administration. If the amount of bile drained is scant, but the jaundice stationary, use of one of the cholagogues may stimulate the liver sufficiently to cause it to excrete a greater amount of fluid, and finally, should the condition of the patient be such that one is uncertain as to whether bleeding is occurring or the drainage tube is obstructed, or if the obstruction is inadequately relieved and the patient's chance of recovery seems seriously handicapped, exploration of the operative site should be undertaken with the least possible delay.

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PRESIDENT'S LETTER

THE medical profession of today faces many important problems that a comparatively few years ago appeared on the horizon merely as faint clouds. There is evidence that our national and state organizations are alive to the need, first, of study of these problems in a fair-minded way and, second, based on that study of concerted action in giving advice as to how these problems may best be solved to the advantage of the public and of the profession. If the medical profession does not give heed to these problems, enthusiastic laymen will have enacted into laws their ideas of a solution which may in reality be positively harmful. The average busy practitioner cannot be expected to devote time to such problems, but it should be recognized that there are available certain of our members who are qualified by knowledge and adaptability to consider and discuss them. These members may or may not be leaders in scientific medicine, but they are nevertheless justly worthy of such recognition because of their knowledge of medical economics. It is unfortunate that men of this type, who are known to be public spirited and unselfish, are often spoken of scornfully as being medical politicians. In the next breath the same critic may enthusiastically insist on the organization and protection of the rights of the profession! Occasionally one hears complaints about the cost of maintaining our state organization. In my opinion the annual dues to our state association directly and indirectly give more in return to members than any like amount that is spent. Since our state organization has become more closely united and since we have had a salaried medical secretary, the Basic Science Act has been passed in our state, the Statute of Limitations has been reduced to two years, and the Medical Practice Act, which protects the people against quacks, cultists, and so forth has been established. The members of our legislative committee are not infallible; they are treading uncharted paths and the going is often hard. There is much yet to be done, and it is even more important to see that what has already been done is not nullified. Constant watchfulness over legislative activities is essential.

Industrial insurance cases comprise an increasing part of the work of the profession of our state. There has been, and still is, disagreement between the profession and insurance companies. This is not as serious as it appears. If insurance companies had the sole right irrespective of conditions to designate the medical attendant, and the patient or the insured person had no right or voice in the selection, the situation would be capable of abuse. If, on the other hand, the patient had the sole right to select his own medical attendant and the insurance company had no right or voice in the matter, the situation would be equally bad. There must be an intermediary position, satisfactory to all parties, so that the rights of the individual will be fairly protected and no unnecessary hardships endured.

The Minnesota State Medical Association has not only been alive to its own problems but it has been largely responsible for the present activity of the American Medical Association in showing that the plan of the Veterans' Administration, to increase the number of hospital beds, is vicious, and provides needless duplication of hospital space. There is a large number of beds available in civilian hospitals all over the country. On the committee appointed conjointly by the American Medical Association, the American Legion and the Veterans' Administration are Dr. Ben Wright, Dr. E. A. Meyerding, Mr. E. B. Cliff, Mr. Paul Fessler, and Mr. A. M. Calvin, all from Minnesota. The rapidity with which the Minnesota plan is being adopted throughout the country by other state associations is exemplified by the general raising of annual dues, and by the employment of full-time secretaries both in the state, and in larger, local medical organizations.

M. L. Henderson.

President,
Minnesota State Medical Association.

EDITORIAL

MINNESOTA MEDICINE

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J. R. BRUCE, Business Manager
4812 Bloomington Avenue, Minneapolis, Minn.
and
2642 University Avenue, Saint Paul, Minnesota
Telephones { *Dupont 1013* / *Nestor 1381*

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THE STATE MEETING

There is no indication of "repression" in the program of the coming State Medical Meeting which appears in this number of the Journal.

The two and a half days of presentation of scientific material have been divided for the most part between the medical and surgical sections with joint sessions for such subjects of widespread interest as transurethral prostatectomy, malignancy, and the numerous demonstrations listed. Movie fans will be able to observe the application of the cinema in medical instruction.

There is no subject more alive in our present economic crisis than that of the hospital care of veterans. The subject is one of fundamental economic importance to the hospitals, medical profession, and taxpayers. That the present method of furnishing hospital care for veterans and the proposed expansion of hospital facilities is an extravagant and unsatisfactory way to furnish this service is the contention of our profession. This subject will dominate the Economics meeting this year.

It has been said that there is nothing new under the sun. This year's program contradicts such a contention. Those who attend the meeting will find much mental stimulation.

ROCKY MOUNTAIN SPOTTED FEVER IN MINNESOTA

A case of Rocky Mountain spotted fever[1] reported recently from Minneapolis focuses the attention of Minnesota physicians on the possibility of this disease being endemic in the State.

In 1915 George Douglas Head[2] of Minneapolis reported a case of typhus fever which occurred in Minneapolis. Whether this case was one of Rocky Mountain spotted fever or typhus is impossible to say. Clinically these two diseases are almost impossible of differentiation. At that time laboratory methods were not sufficiently developed to make the distinction. Kemp and Grigsby[3] have reported a case of Rocky Mountain spotted fever in the vicinity of Dallas, Texas. Badger, Dyer and Rumreich[4, 5] have described cases of Rocky Mountain spotted fever occurring in Virginia and have noted variations in the animals inoculated with virus obtained from Montana as compared with animals inoculated with the virus obtained from the East. There was less virulence associated with Eastern virus. They have suggested calling the two types Eastern and Western, respectively. It is to be noted that the strain isolated in Minnesota differs in its reaction in guinea pigs from the Eastern and from the Western strain, but immunizes against either strain.

Badger, Dyer and Rumreich also were able to show that the dog tick (*Dermacentor variabilis*), distributed throughout the Eastern areas where Rocky Mountain spotted fever has been found, is able to transmit the disease. *Dermacentor andersoni* (also called *Dermacentor modestus*), the transmitter of the moutain strain, is strictly limited to the intermountain area between the Cascades and Rockies from the northern border of the United States as far south as Southern Nevada and Utah. Maver[6] had previously reported *Dermacentor variabilis* as a carrier and also showed *Dermacentor marginatus* and *Amblyom-*

ma Americanus as possible transmitters. *Dermacentor occidentalis* has been shown to transmit the disease on the West Coast (California).

Toomey[7] describes the Eastern area of distribution for the Eastern type of Rocky Mountain spotted fever from the southern border of New York to the northern border of Florida and from the Atlantic coast line to the Appalachian mountains. If this is correct, what of the cases reported in North and South Dakota and Nebraska and of our own case in Minnesota? Toomey limits the original Rocky Mountain spotted fever to the distribution of *Dermacentor andersoni.* The finding of this disease in states east of the Rockies extending to the Atlantic seaboard raises the question, has the disease always been endemic in regions east of the Rockies or has there been a migration of the disease from the epidemic area due to some ecological imbalance? Along this line one can assume that the reservoirs (rodents) certainly have been disturbed by cultivation, deforestation, railroads, automobiles, etc.

There are three ticks common in Minnesota: the dog tick (*Dermacentor variabilis*), the rabbit tick (*Hemaphysalis leporis palustris*), and the bird tick (*Hemaphysalis cinnabarina*). Of these the dog tick is the transmitter in this State because it is the only one which feeds on man.

Dr. Parker states that: "Nearly ten thousand ticks have been tested at the U. S. Public Health Service Laboratory at Hamilton, Montana, in cooperation with Dr. R. G. Green of the University of Minnesota Medical School, and in excess of one per cent of the American dog tick, *Dermacentor variabilis,* and two per cent of the rabbit tick, *Hemaphysalis leporis palustris,* have provoked reactions in laboratory animals which, had the ticks been collected in a known endemic area, would be considered definite evidence that the ticks concerned were carrying a low grade Rocky Mountain spotted fever virus."

During the coming months it would be well for physicians of this State to be on the watch for obscure fevers with rashes as possible cases of spotted fever. The blood of all suspects should be sent in to the State Board of Health for the Weil-Felix reaction. The Weil-Felix reaction is common to both typhus and Rocky Mountain spotted fever. Dr. H. A. Reimann, of the Department of Medicine of the University of Minnesota, will be glad to check all positive cases by cross immunological test on animals. In this manner the prevalence of spotted fever and its characteristics in Minnesota will be realized.

H. L. U.

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IMMUNITY AND HYPERSENSITIVITY

We must remain so alert to the general trend of opinion based upon investigation in such a bewildering variety of fields that all too often we, as general readers, give up. So-called practical minds decry what they term theoretical hair splitting to the point that far too much time elapses between the announcement of victorious research and its therapeutic application by physicians. It is likely that insulin has come into use all too slowly and years will elapse before the present hematopoietic stimulants are used with even the decisiveness presently known and proven.

A recent excellent review of staphylococcus infection in a report* of the "General Staff Conference of the University Hospitals" has much of interest in terms of this ubiquitous invader and those aware of its possibilities need not be told to approach boils and carbuncles with circumspection. However, I wish particularly to draw attention to the thought expressed in the report which is crystallizing about Clawson's teaching that there is a profound difference in the animal reaction to intramuscular and intravenous injections of killed bacteria (vaccine). The latter seems to decrease sensitivity, the former to promote it. Sensitivity and immunity or healing do not appear to proceed coördinately. A supersensitive host appears to predispose to exudative reactions, confronting the presence in the tissues of the autogenic source. With staphylococci it is a series of abscesses among which kidney and bone foci stand out conspicuously. In tuberculosis localized nidi (such as, for example, caseating glands), with tissue supersensitivity lay the foundation for allergic subclavicular extensive exudative Assmann-Redeker reactions. In subacute bacterial endocarditis the blood stream is actually fed live virulent organisms. The titer for their agglutination may rise enormously high. Wherever these embolic masses lodge there is little exudation and never abscesses.

The work of Petroff, Florence Sabin, and others, experimentally, injecting the fraction products of tubercle bacilli into animals, appears

*By Assistant Professor Wm. A. O'Brien.

to prove that the sensitivity and allergy are promoted by the protein fraction, and immunity by the lipoid portion. Such studies may ultimately straighten out the devious tangle of BCG and establish less mooted tuberculosis prevention. In the meantime less gifted and endowed humble practitioners may well hesitate in the use of general and specific vaccines, at least in boils and "rheumatism," and leave to further investigation the answer to the possible use of intravenous vaccines where desensitization appears of therapeutic benefit.

E. L. T.

THE MEDICAL CARE OF VETERANS

The apparent present status in Minnesota

We hope you all have read the page on medical care of veterans in the April number of MINNESOTA MEDICINE. The committee of the Ramsey County Society has continued its good work; we understand that several Ramsey County Legion Posts have taken an interest in the problem. In Hennepin County a committee has been at work since January. The doctors are well informed and several Posts have expressed their interest. The District Dental Society is becoming actively interested also. We hear that the problem is receiving careful attention on the part of medical societies and Legion Posts throughout the state.

Resolutions in support of several different plans for the care of veterans have been passed, some of them on insufficient information, and, insofar as I can see, with very little prospect of support from the Legion of the State or from the medical profession as a whole.

At the recent spring conference of the Minnesota Department of the Legion there were many frank informal discussions between interested physicians in and out of the Legion and the leaders of the Minnesota Legion's rehabilitation work. Coöperation between the Legion and the medical profession is essential in solving the problem. In this state it should be relatively easy to establish a basis for coöperation.

While I cannot at this time speak for the Committee on State Health Relations, it seems to me that it may be helpful to give some statement of the problem as I see it in order to reduce the points of argument to a minimum. Fortunately in Minnesota the Legion has studied the problem intelligently and has been leading the national Legion in that matter.

We seem to be agreed on the present accepted practice that disabilities of service origin as well as tuberculosis and nervous and mental diseases, because of presumptive service connection, should be cared for in veterans' hospitals. It must be remembered in this connection also that the Veterans Bureau provides that, in case of emergency, service-connected disabilities may be hospitalized in their home communities at government expense.

The Minnesota department of the Legion last year proposed that the right to be hospitalized in his home community at government expense be extended to the veteran suffering from a non-service-connected ailment in case of emergency. It seems to me that we should have no hesitation in doing all we can for the adoption of such a plan.

The care of medical and surgical non-service-connected disabilities not constituting emergencies is still under discussion, and many of the questions raised are far from solution; doctors themselves do not seem to agree in some respects.

The Minnesota Legion leaders say that in their experience in this State they have made satisfactory progress only when they have attacked the veterans' problems one step at a time. They insist that their proposal for emergency care of veterans in their home communities must be proven effective in practice before they will endorse any extension of the principle to non-emergency cases.

It seems to me that there is much to say in favor of that idea. Emergency cases are the ones most in need of prompt care close to home. Adoption of such a plan will destroy the strongest arguments used in favor of the construction of additional veterans' hospitals. If it can be proved that veterans can receive as good care or better in their home community hospitals by doctors of their own choice in cases of emergency, it will be easier for the Legion and others to believe that such care would be good in other cases.

The above ideas are not given officially, but rather to stimulate thought and discussion. If you have other ideas please let the Committee on State Health Relations hear from you at once. We hope that the State Medical Association and the Minnesota Department of the American Legion through continued coöperation can work together toward some satisfactory solution of the entire problem of the medical care of veterans.

T. H. SWEETSER.

COÖPERATIVE CLINIC TOURS

Perhaps sufficient emphasis has not been given in our columns to the foreign clinic tours which have been arranged by the various State Medical Journals with the Amerop Travel Service for this summer. Notice has just been received that reductions in rates by the steamship companies have resulted in a lowering of the figures for the clinic tours stated in our last issue of the Journal. First class accommodations have been reduced

$150 and tourist $47.50, which makes the clinic tours this summer more attractive than ever. It will be noted that all three tours provide for attendance at the Centennial Anniversary meeting of the British Medical Association, a further special attraction this year. Clinics are being arranged in the principal cities of Europe, London, Paris, Vienna, and Berlin. Choice of the steamers Bremen and Europa of the North German Lloyd Line leaves nothing further to be desired in the way of accommodations.

The State Journals have no hesitation in recommending these Clinic Tours to Association members and believe the trips will offer valuable clinical opportunities combined with a vacation trip abroad. Further details may be obtained upon inquiry at the office of MINNESOTA MEDICINE or by writing direct to Amerop Travel Service, 132 North LaSalle Street, Chicago.

OF GENERAL INTEREST

Dr. Rollin E. Cutts, formerly of the Mayo Clinic, Rochester, Minnesota, is now associated with the Vicksburg Clinic, Vicksburg, Tennessee.

Dr. H. J. Fortin, formerly of the Mayo Clinic, Rochester, Minnesota, has opened offices at 802 Black Building, Fargo, North Dakota.

Dr. H. C. Thornton is now on the staff of the Indianapolis City Hospital, Indianapolis, Indiana. He was formerly associated with the Mayo Clinic, Rochester, Minnesota.

Dr. V. S. Cabot has been elected chief of staff at St. Barnabas Hospital, Minneapolis, with Dr. Joseph Hedding, vice president, and Dr. W. B. Holt, secretary-treasurer.

Dr. J. F. McClendon, professor of Physiological Chemistry at the University of Minnesota, has arrived in Japan, where he will conduct research work in iodine and goiter as a visiting professor at Tohoku Imperial University.

The new infirmary building of the Walker Sanatorium, which was formally opened early in April, will accommodate eighty patients and has facilities for emergency operating rooms, staff consultation room and library, and clinical examination rooms.

Dr. F. C. Rodda, Minneapolis, was guest speaker at the last regular meeting of the Washington County Medical Society held March 8 at the Stillwater Club rooms. Dr. Rodda's subject was "Deficiency Diseases of Childhood."

Dr. Leonard G. Flannagan has become associated in practice with Drs. Leck and Morrow at Austin, Minnesota. Dr. Flannagan is a graduate of the University of Minnesota and has been affiliated with the Lakeside Hospital, Cleveland, Ohio. His specialty is the treatment of diseases of the eye, ear, nose and throat.

INTENSIVE EUROPEAN SUMMER COURSE

The eleventh intensive European summer course in Ophthalmology and Otolaryngology and the second in Surgery, Gynecology and Obstetrics under the direction of Dr. George W. Mackenzie, of Philadelphia, will be held in Vienna from July 8 to August 19 inclusive. The M. S. St. Louis sails June 25, which will allow for a few days in Berlin. Some fifty hours of lectures on ship-board are included in the course. For details address Dr. George W. Mackenzie, 1724 Spruce St., Philadelphia.

STATE BOARD OF MEDICAL EXAMINERS

NEGRO QUACK VIOLATES COURT ORDER AND LANDS IN COUNTY JAIL

State of Minnesota *vs.* Robert McGraw

Robert McGraw, negro quack of itinerant fame, has discovered, much to his sorrow, that he could not violate the terms of a suspended sentence given him last June by Judge Tifft, Glencoe, Minnesota, and get away with it. On June 12, 1931, McGraw entered pleas of guilty to two charges of practicing healing without a Basic Science Certificate before the Honorable C. M. Tifft, Judge of the District Court, and was fined $225.00 and costs on the first charge and given a suspended sentence of one year in the County Jail on the second charge. McGraw at that time expressed an ardent desire to return to his native State of Illinois. One of the conditions of the suspension of sentence required McGraw to refrain from the practice of healing in the State of Minnesota until properly licensed.

The State Board of Medical Examiners discovered that in the fall of 1931 McGraw came into Lyon County, Minnesota, and extracted the sum of $250.00 in cash to cure an alleged case of cancer. At that time McGraw was located in Sioux City, Iowa. About the first of March, 1932, McGraw moved back into Todd County, Minnesota, and located on a farm some four miles northeast of Bertha. Following an investigation of the Medical Board, Judge Tifft, on April 2, 1932, revoked the suspension of sentence and ordered McGraw committed to the McLeod County Jail to serve his one year sentence. On April 5, McGraw was arrested on the Henry Paschke farm in Todd County and returned to the McLeod County Jail, where he is now confined according to law. This is the first time since the enactment of the Basic Science Law in Minnesota that a quack has been ordered to serve the maximum sentence provided for a violation of the law.

SQUIBB ADEX TABLETS 10 D NOT ACCEPTABLE FOR N. N. R.

The Council on Pharmacy and Chemistry reports that it refused recognition to the name Adex Tablets 10 D for a cod liver oil concentrate fortified by addition of viosterol. The Council has repeatedly called attention to the fundamental importance of the rules designed to prevent the multiplication of names for the same product. This rule provides that the discoverer of a new product or of a new and sufficiently important therapeutic use for an old product may give it an arbitrary name. Squibb & Sons are not the first to prepare a cod liver oil concentrate nor does the addition of viosterol to a cod liver oil concentrate present a discovery. While Squibb & Sons deserve credit for the efforts which they have made toward increasing the potency and stability of cod liver oil concentrates, other firms have worked in the same direction. The Council decided that it could not recognize the name Squibb Adex Tablets 10 D because the application of a proprietary name to this product is not in the interest of the medical profession or the public and declared Squibb Adex Tablets 10 D unacceptable for New and Non-official Remedies. (Jour. A. M. A., March 19, 1932, p. 983.)

A FORUM OF THE COMMITTEE ON PUBLIC HEALTH EDUCATION

A patience and determination of almost Jovian proportions are needed by a medical profession that proposes to educate the public in modern methods of disease prevention. Such is the opinion of Dr. J. R. Neal of Springfield, Ill., president-elect of the Illinois State Medical Society, expressed recently before the Chicago Medical Round Toble.

To those medical economists who have been in the habit of dismissing public health education as a simple matter and less important, perhaps, than purely legislative activity, the following excerpts from Dr. Neal's paper may be of especial interest.

Dr. Neal regards the state of public knowledge of modern disease prevention as comparable to the state of mind of Indian savages when the savages were first introduced by the French to civilized government and a civilized religion. The Indians watched and listened, deeply impressed. But when the ceremonies were over and the voyageurs had departed they reverted to the Great Spirit and, incidentally, stole the metal arms of France from the cross for bullets for their new guns. Ultimately many of the Indians did adopt the white man's ways and some rose to high levels of civilization. These were the ones whose education began when they were children. But the progress was slow and it became noticeable only when it was possible to control the entire education of the children.

"Substitute the modern medical profession for the handful of French adventurers," says Dr. Neal; "let the public take the place of the Indians; and call scientific medicine the white man's laws and customs and we have, in 1931, an almost perfect reproduction of the scene enacted on the 14th of June, 1671, at Sault Ste. Marie.

"Scientific medicine, as we understand it today, is a very youthful development. Bacterial life and its relation to disease was discovered less than 100 years ago. Anesthesia has not yet celebrated its hundredth anniversary. The practice of faith healing, on the other hand, and of strange manipulations of the body, of invoking charms and of mixing the extracts of roots and herbs is as old as history itself. The idea that sickness originates from mysterious sources and that occult power, aided and abetted by incantations, is required to deal with it, harks back to the very earliest times.

"Entrenched as they are in the very marrow of the race these ancient traditions and superstitions will not be easily displaced. It is a difficult task even for the school to do the job, because the influence of parents frequently overbalances that of the teacher in such matters. . . .

"Some of the state medical societies have recently organized popular educational movements which are doing splendid, if limited, work. In Illinois, through speakers' bureaus and newspaper service and radio broadcasts, a very commendable educational work has been accomplished. Here, again, the magnitude of these efforts is diminutive in comparison with campaigns of education undertaken by the venders of nostrums and health foods. . . .

"Probably the most important and at the same time the educational results is the state normal colleges. Here the teachers who get hold of the children in the primary grades are trained. . . .

"The medical profession has recognized the importance of education. It has sometimes erred, however, in the method of enlightening the public. Most of its efforts have been expended along legislative lines. That way brings the quickest but, in many cases, the least return. It operates well among people who can choose wisely between the bona fide and the false and it is necessary as far as it goes. But more than one-half of our population has never been to high chool. For these, the influence of racial practice and belief is important. Traditions and customs as old as history are replaced in the public mind with the greatest difficulty. To do it one must begin with the child. Louis XIV could not sit upon his throne in Paris and transform by edict the customs and habits of a savage people 3,000 miles away."

OBITUARY

Dr. Eugene Hubbell
1855-1932

Dr. Eugene Hubbell, Saint Paul, died on April 20, 1932, following a short illness.

Dr. Hubbell was graduated from Hahnemann Medical College of Chicago in 1883, after which he practiced in Clearwater, Minn., for four years and later in Waseca for two years. He had been active in practice ever since he came to St. Paul forty-two years ago.

Dr. Hubbell was a member of the American Institute of Homeopathy, had served as president of the Minnesota Institute of Homeopathy and the Twin City Homeopathic Society. He had also been president of the American Association of Orificial Surgeons and the National Society of Physical Therapeutics. Dr. Hubbell was a member of the Allied Medical Association of America and the National Society of Medico-Physical Research.

Besides his widow, Dr. Hubbell is survived by three daughters, Mrs. R. A. Thuma of Saint Paul, Mrs. J. F. Gage of Atlanta, Ga., and Mrs. W. C. Scott of Chicago, and a son, Arthur C. Hubbell of Saint Paul.

Dr. W. J. Kremer
1878-1932

Dr. Walter J. Kremer, a member of the staff of St. Mary's hospital and consulting urologist of the United States Veterans' bureau, died Saturday, April 2, 1932, at the Veterans' hospital. He was fifty-three years old.

Dr. Kremer was born in Owatonna, Minn., April 25, 1878, and later moved to Cold Springs, Minn. After completion of a two years' academic course at St. John's University, he entered the University of Minnesota medical school, where he obtained his doctor's degree in 1911. After an eighteen-months' internship at the Minneapolis General hospital, Dr. Kremer began practice in Minneapolis.

During the World war he enlisted in the medical corps and was assigned to a base hospital at Camp Gordon, Ga., where he was commissioned a first lieutenant. After the war he resumed practice in Minneapolis.

He was a member of the American College of Surgeons, Minnesota State Medical Association, Hennepin County Medical Society, Minneapolis Clinical Club, the Urological Society of the Twin Cities and Nu Sigma Nu, medical fraternity. He was associate urologist at General Hospital, a former instructor in urology at the University of Minnesota, and formerly attending urologist at Park View Hospital.

Surviving are his mother and father, Mr. and Mrs. Ignatius Kremer of Cold Springs; two brothers, George of Fargo, N. D., and Charles of Cold Springs, and a sister, Clara, of Cold Springs.

Dr. John Vincent O'Connor
1867-1932

Dr. John Vincent O'Connor, Saint Paul, died at St. Joseph's Hospital on April 5, 1932, following a five weeks' illness.

Born in Minneapolis, September 1, 1867, of Irish parentage, he received his early education in the public schools in this state and in Ohio. After taking advanced musical instruction from Herman E. Zolk of Minneapolis, Dr. O'Connor became an accomplished pianist of unusual taste and ability. As a teacher of music he was enabled to pay his way through the medical course at the University of Minnesota, where he obtained his degree in 1895.

Dr. O'Connor practiced at Watkins, Minnesota, and later at Waverly, Minnesota, where he married Nellie Giblin, a native of Pennsylvania. After taking work at the New York Post-Graduate School and Hospital, he moved to Saint Paul in 1901, where he engaged in general practice until his final illness. He was one of the first tenants of the Lowry Building and joined the Ramsey County Medical Society, May 26, 1902.

Dr. O'Connor held the office of state examiner for the A. O. H. and was examiner for the Union Central Life Insurance Company. He was a member of the A. O. U. W., the M. W. A. and a charter member of the K. of C.

Dr. O'Connor is survived by his wife and five children, Gertrude H., Edna M., John G., Donald E., and Emmett J. O'Connor.

Dr. Lincoln E. Penny
1860-1932

Dr. Lincoln E. Penny, Saint Paul, died Monday, March 28, 1932, at the age of seventy-two, at St. Luke's Hospital after an illness of two days.

Dr. Penny was born in Arcadia, Wisconsin, in 1860. He graduated from Hahnemann Medical College in 1882 and Rush Medical College, Chicago, in 1885. After his graduation he moved to Saint Paul, where he practiced continuously until his death, a period of over forty years.

Dr. Penny served as a member of the staff of attending physicians at Ancker Hospital for thirty years.

Dr. Penny was a member of the American Institute of Homeopathy, and joined the Ramsey County Medical Society, the Minnesota State Medical Association and the American Medical Association in 1926.

In the passing of this beloved pioneer, an unexcelled example has been set to the younger generation by his honesty, professional courtesy and devotion to duty. Dr. Penny is survived by his widow, Mrs. Elsie Penny.

Dr. William Jesse Taylor
1844-1932

Dr. W. J. Taylor, pioneer physician in Minnesota, died at his home in Pipestone, Friday, April 15, 1932, at the age of eighty-eight.

William Jesse Taylor was born in Cataragus county, New York State, April 18, 1844. At the age of eight years accompanied his parents to Dane County, Wisconsin, and grew to manhood on a farm eight miles west of the city of Madison. He received his early education in the common schols of Dane County, later attending the University of Wisconsin and Rush Medical College.

He enlisted August 20, 1862, in Co. K., 32nd Wisconsin Volunteer Infantry, and served for nearly three years, being mustered out June 12, 1865. Following the war he returned to Wisconsin and completed his education.

He began practice of the medical profession at Black Earth, Wis., in 1873, but remained there only until May of the following year. In June, 1874, he made his first visit to Pipestone County, and at that time decided to make his future home there. While on this initial visit to the county, he participated in the first Republican county convention, attended by the only three men then in the county. Dr. Taylor was chosen to represent the county at the congressional convention at Owatonna later that year.

Dr. Taylor remained in the vicinity long enough to select his claim, as a soldier's homestead, and tree claim. He returned to Wisconsin and spent the winter of 1874-75 teaching in Dane County. In the spring of 1875 he again came to Pipestone County and built a house on his claim, remaining there until June. He re-

turned to Wisconsin and remained there until March, 1876, when he came to Pipestone County to reside permanently, his wife joining him there later that year.

The crop on his farm being destroyed that summer by grasshoppers, Dr. Taylor went to Luverne to practice has profession, and spent most of his time there the next three years, his family meanwhile residing on his claim. In March, 1879, he returned from Luverne and arranged to practice in Pipestone. From that time he was for nearly fifty years active as a medical practitioner in this city and vicinity. At his office in Pipestone on June 7, 1888, the Southwestern Minnesota Medical Society was organized, and in 1901 Dr. Taylor was elected president of that society. He was at one time president of the Minnesota Public Health Association, and was a member of its board of directors at the time of his death, being re-elected last year. For some time he held the office of Surgeon in the Minnesota Department, G. A. R. He was for years a member of the Pension Examining Board for his district, and served as a member of the city and county health boards.

At different times Dr. Taylor had partners in the medical practice here, among these being Dr. Wm. McGillivray, Dr. George D. Rice and Dr. G. F. Schmidt. At a later time the Pipestone Clinic was organized with Dr. Taylor as a member, and during the last years of his practice he was associated, though not as a partner, with Dr. E. G. McKeown.

Dr. Taylor was active in civic and fraternal affairs and held numerous offices in these fields of endeavor.

Surviving are four children: Orville S. Taylor, St. Cloud, Minn.; Mrs. Luella McGillivray, Pipestone; Mrs. Oliver Bullard (Mayme), Spooner, Wis.; Mrs. Grant S. Beardsley (Maude), Eugene, Ore.; and Miss Jane Taylor, Everett, Wash.; also eight grandchildren, and one great grandchild. One brother, Orville J. Taylor, of San Diego, Calif., also survives.

Dr. Stephen O. Watkins
1851-1932

Dr. Stephen O. Watkins, eighty-one years old, died Monday, April 11, 1932, at the Masonic home in Bloomington, where he had lived for two and a half years.

Born at Amherst, N. H., Dr. Watkins practiced medicine in Minnesota for fifty years before his retirement in 1920. For several years he was physician for the Northern Pacific Railroad and lived at Carlton when it was called N. P. Junction. He was a charter member of Palestine Masonic lodge of Duluth.

Survivors are a daughter, Mrs. W. C. Carlson of Seattle; a son, S. Elmer Watkins of Phoenix, Ariz., and two sisters, Mrs. J. E. Green of Carlton, and Abby Watkins of Los Angeles.

A disease of the Rocky Mountain spotted fever type has been identified as occurring in States in the eastern and southeastern sections of the United States. During the course of field investigations of endemic typhus it became apparent that many of the cases observed differed materially in clinical aspects from endemic typhus as described by earlier investigators. It was noted that many of the patients suffered from a very severe disease which did not correspond to the clinical picture of endemic typhus and which resembled the spotted fever of the Rocky Mountains more closely than it did any other disease. Moreover, quite a high proportion of these cases gave a history of tick bite within a short time preceding onset. Laboratory studies confirmed the epidemiological findings. This eastern type of spotted fever has so far been found to exist in rural communities in Delaware, Pennsylvania, Maryland, the District of Columbia, Virginia, and North Carolina.—*Health News*, U. S. P. H. Service, March 29, 1932.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

PROGRAM 79TH ANNUAL MEETING MINNESOTA STATE MEDICAL ASSOCIATION, ST. PAUL AUDITORIUM

The Council will hold its first meeting at 6:30 p. m. Sunday, May 22, at the Lowry Hotel. It will meet again at noon, Monday, May 23, and at 2:30 Tuesday, May 24.

The House of Delegates will meet at 9 a. m. Monday, May 23, at the Auditorium, and for luncheon at noon Tuesday, May 24, at the Minnesota Club.

REFERENCE COMMITTEE

A. N. Collins.....Duluth
C. B. Wright.....Minneapolis
W. C. Carroll.....St. Paul
O. E. Locken.....Crookston
R. V. Williams.....Rushford

SCIENTIFIC PROGRAM
Monday, May 23, 1932

SCIENTIFIC CINEMA
Exhibit Hall—1:00 to 4:30 P. M.

Selected scientific films will be shown all afternoon.

CLINICO-PATHOLOGICAL CONFERENCES
Surgical Hall—1 P. M.
Presiding Officer, Wm. A. O'Brien

Ancker Hospital Staff—J. F. Noble, Conductor, St. Paul
Mayo Clinic Staff—H. E. Robertson, Conductor, Rochester
St. Mary's Hospital Staff—E. L. Tuohy and G. L. Berdez, Conductors, Duluth
University Hospitals Staff—Wm. A. O'Brien, Conductor, Minneapolis

CLINICO-RADIOLOGICAL CONFERENCES
Surgical Hall

Mayo Clinic Staff—B. R. Kirklin, Conductor, Rochester
University Hospitals Staff—Leo Rigler, Conductor, Minneapolis

THE MINNESOTA RADIOLOGIC SOCIETY
Medical Hall

Radiological program at 2:00 P. M.
Monday Evening—May 23
Technical Exhibits (Open until 8:00 P. M.)

MEDICAL ECONOMICS MEETING
Auditorium Theatre—8 P. M.
Hospital and Medical Care of Veterans
Paul Fesler, President, American Hospital Association, *Chairman*

The Community Hospital—Edward A. Fitzpatrick, Dean, Marquette University, Milwaukee
The American Legion—E. V. Cliff, Ortonville
The Public—F. R. Bigelow, Saint Paul
The Doctor—Dr. Olin West, Chicago

Tuesday Morning, May 24
SECTION OF MEDICINE
8 A. M.

Presiding Officers—C. A. McKinlay, Minneapolis
A. M. Snell, Rochester

The Diagnosis and Treatment of Cardiac Arrhythmias—O. E. Locken, Crookston
Practical Aspects of Allergic Disease—F. W. Gaarde, Rochester

Symposium on Functional Disorders

Functional Gastro-Intestinal Disturbances — C. B. Wright, Minneapolis
Cardiac Neuroses—H. E. Richardson, St. Paul

Treatment of Affective Disorders—J. C. MICHAEL, Minneapolis
The Element of Fear in the Development of Functional Disorders—A. D. HOIDALE, Tracy
The Appeal of Quackery to the Neurotic Patient—W. C. ALVAREZ, Rochester
General Discussion—Opened by: E. L. TUOHY, Duluth

SECTION OF SURGERY
8 A. M.

Presiding Officers—GEORGE EARL, St. Paul
J. R. MANLEY, Duluth

Estimation of Disability in Industrial Cases—EDW. T. EVANS, Minneapolis
Factors of Safety in Emergency Abdominal Surgery—V. S. COUNSELLER, Rochester
Emergency Treatment of Eye Injuries—HENDRIE W. GRANT, St. Paul
Glandular Dysfunction as Related to the Sexual Hormone—GEORGE E. HUDSON, Minneapolis
Intestinal Intussusception in Infants—J. M. HAYES, Minneapolis
Renal Factors in the Surgical Abdomen—HERMAN H. JENSEN, Atwater
Hard of Hearing Problem—M. W. WHEELER, St. Paul
Fracture Work in the Smaller Community—B. J. BRANTON, Willmar

SCIENTIFIC CINEMA
8:20 A. M.

F. C. SCHULDT, Chairman
F. H. STROM, Technical Adviser
D. A. LEONARD, Projection Supervisor

Cancer Research—Lecturer: WM. A. O'BRIEN, Minneapolis. Courtesy of the American Journal of Cancer
Repair of Second and Third Degree Lacerations of the Perineum and Rectocele—(Talkie.) Courtesy of Petrolagar Company
Delivery of Twins—Lecturer and Producer: J. J. SWENDSON, St. Paul
Cesarean Section—Lecturer and Producer: J. J. SWENDSON, St. Paul
Some Features of Hospital Administration—(Talkie.) Courtesy of Petrolagar Company
Anatomy of the Female Pelvis and Perineum—(Talkie.) Courtesy of Petrolagar Company

DEMONSTRATIONS
10 A. M.

The Physiologic Action of Animal Venoms—HIRAM ESSEX, Rochester
Tuberculin Test—J. A. MYERS, Lymanhurst School, Minneapolis
Blood Transfusion—H. E. HULLSIEK, St. Paul
The Use of the Artificial Larynx—G. B. NEW and CHARLES SHEARD, Rochester
Fresh Pathology—E. T. BELL, Minneapolis
Detection of Deafness (Group and Individual Tests)—M. W. WHEELER, St. Paul
Clinical Pathology—Including Congo Red Test for Amyloid, Friedman Hormone Pregnancy Test and Photoelectric Hemoglobinometer—A. H. SANFORD and T. B. MAGATH, Rochester
Use of Ketogenic Diet in Urinary Infection. A Demonstration of the Effects of Diet on Bactericidal Power of Urine with Results in Treatment.
In children—H. F. HELMHOLZ, Rochester
In adults—A. L. CLARK, Rochester
Pathogenic Parasites in Man—REED O. CHRISTENSON, Minneapolis
Phases of Bronchoscopy and Esophagoscopy of Importance in General Practice—VIRGIL J. SCHWARTZ, Minneapolis
Diphtheria Immunization and Schick Test—B. F. SIMON, St. Paul
Syphilis—Practical Points in the Therapy of—PAUL A. O'LEARY and L. A. BRUNSTING, Rochester
Trichomonas Vaginalis—RUSSELL MOE, Duluth
Oleothorax—F. F. CALLAHAN, Pokegama
Undulant Fever—LUCY HEATHMAN, Minneapolis
Cholecystographic Technic—B. R. KIRKLIN, Rochester
Surgical Use of Maggots—GORDON MACRAE, Duluth
Professional Pharmacy as Applied to the Physicians. Under the auspices of the Inter-Professional Relationships Committee of Hennepin County

GENERAL ASSEMBLY
11 A. M.

Fractures in and about the Neck of the Femur—W. C. CAMPBELL, Memphis, Tenn.
Discussion—EMIL GEIST, Minneapolis; M. S. HENDERSON, Rochester

GENERAL ASSEMBLY
1 P. M.

Changing Attitudes towards the Malignancy Problem—WM. A. O'BRIEN, Minneapolis
Discussion—W. J. MAYO, Rochester

SCIENTIFIC CINEMA
1 P. M.

Hemorrhoidectomy—An Anatomical Method—Lecturers and Producers: W. A. FANSLER and J. K. ANDERSON, Minneapolis
Cancer of the Skin—Lecturer: WM. A. O'BRIEN, Minneapolis. Courtesy of the American Journal of Cancer
Repair of Urethrocele, Cystocele, and Lacerations of the Cervix—(Talkie.) Courtesy of Petrolagar Company
Bone Tumors—Lecturer: WM. A. O'BRIEN, Minneapolis. Courtesy of the American Journal of Cancer.
A Simplified Method of Filming Surgical Procedure Available to Everyone—Lecturer and Producer: L. A. JULIN, *Rochester*
Surgical Technic of Nephrectomy, Pelviolithotomy, Ureterolithotomy and the Surgical Removal of Urethral Strictures—Lecturer and Producer: WALTMAN WALTERS, Rochester
The Tucking Operation for Strabismus—Lecturers and Producers—F. E. BURCH and HENDRIE GRANT, St. Paul
Preliminary Hemostasis in Goiter Surgery—Lecturer Producer: MARTIN NORDLAND, Minneapolis
The Gillette State Hospital for Crippled Children—Lecturer: C. C. CHATTERTON, St. Paul

SECTION OF MEDICINE
2:30 P. M.

Treatment of Trichophytosis—L. A. BRUNSTING, Rochester
Recent Developments in the Treatment of Syphilis—H. E. MICHELSON, Minneapolis
The Use of Spinal Anesthesia in Gastric Crisis in Tabes—GORDON R. KAMMAN, St. Paul
Agranulocytosis—E. T. F. RICHARDS and KANO IKEDA, St. Paul
Correlation between Clinical and X-ray Findings in Tuberculous Individuals—H. A. BURNS, Ah-Gwah-Ching

Symposium on Pediatrics

Treatment of Epilepsy in Childhood—IRVINE MCQUARRIE, Minneapolis
Present Status of Prevention and Treatment of Scarlet Fever—E. S. PLATOU, Minneapolis
Diagnosis and Treatment of Pyelitis—H. F. HELMHOLZ, Rochester
Simplified Infant Feeding—O. W. ROWE, Duluth

Discussion—Opened by: W. R. SHANNON, St. Paul; THOMAS MYERS, St. Paul
Globus Hystericus—ANDREW SINAMARK, Hibbing
Diagnosis of Laryngeal Disease—L. R. BOIES, Minneapolis
Ocular Lesions of General Diseases—J. F. BRUSEGARD, Red Wing
End-results Following Operations in Congenital Pyloric Stenosis—A. E. SOHMER and R. N. ANDREWS, Mankato
Some Clinical Aspects of Spinal Injuries—E. MENDELSSOHN JONES, St. Paul
Hyperparathyroidism—JOHN DE J. PEMBERTON, Rochester
Cervical and Abnormal First Thoracic Ribs—W. C. CARROLL, St. Paul
Extra-uterine Pregnancy—IVAR SIVERTSEN, Minneapolis
Abscess of the Liver—A. N. COLLINS, Duluth
Surgical Treatment of Urogenital Tuberculosis—GILBERT J. THOMAS, Minneapolis; THOS. J. KINSELLA, Oak Terrace
Comparison of Duodenal Ulcer in Germany and the United States with Surgical Indications—WALTMAN WALTERS, Rochester; WALTER SEBENING, Frankfort-on-the-Main, Germany

ANNUAL BANQUET

Banquet Hall, Lowry Hotel
7 P. M.

Toastmaster—W. J. MAYO, Rochester
Address of Welcome—E. V. GOLTZ, President, Ramsey County Medical Society, St. Paul
The State Association—M. S. HENDERSON, President, Rochester, and the new President-elect.
The Women's Auxiliary—MRS. EDWARD SCHONS, President-elect, Saint Paul
Your Medical School—DEAN R. E. SCAMMON, University of Minnesota
Address—REVEREND W. C. SAINSBURY, Fargo, N. D.
Dancing
Open House—Ramsey County Medical Society Rooms, 15th Floor, Lowry Medical Arts Building

WEDNESDAY MORNING, MAY 25

SECTION OF MEDICINE

8 A. M.

Diverticula in the Gastro-Intestinal Tract—R. G. ALLISON, Minneapolis
Primary Carcinoma of the Lung—E. J. SIMONS, Swanville
Case Report on Epidemic Encephalitis—B. J. CRONWELL, Austin
Sciatic Syndrome—W. P. GARDNER, St. Paul
Recent Advances in Endocrinology—L. G. ROWNTREE, Rochester
Chronic Arthritis; Recent Studies on Etiology and Intravenous Vaccine Treatment:
1. Experimental Basis—B. J. CLAWSON, Minneapolis
2. Clinical Phases—MACNIDER WETHERBY, Minneapolis
3. Discussion—Opened by: F. H. K. SCHAAF, Minneapolis

SECTION OF SURGERY

8 A. M.

Important Points in Surgery of the Diseased Thyroid—MARTIN NORDLAND, Minneapolis
Anal Fistulæ—L. A. BUIE, Rochester
Gradual Decompression of the Biliary System—JOHN CULLIGAN, St. Paul
Acute Intestinal Obstructions—W. G. STROBEL, Duluth
The Noisy Ethmoids and Their Associates—W. L. BURNAP, Fergus Falls
Sodium Amytal Anesthesia in Obstetrics—J. J. SWENDSON, St. Paul
Subdiaphragmatic and Liver Abscess—WALTER G. BENJAMIN, Pipestone
Present-day Surgical Treatment of Carcinoma of the Rectum and Rectosigmoid—FRED W. RANKIN, Rochester

SCIENTIFIC CINEMA—8:20 A. M.

Same Program as Tuesday Morning

DEMONSTRATIONS

10 A. M.

Retinal Vascular Changes—H. P. WAGENER, Rochester
Spotted Fever and Tularemia—R. R. PARKER, Hamilton, Montana, and R. G. GREEN, Minneapolis
Varicose Leg Ulcers—G. D. BRAND, St. Paul
Chronic Ulcerative Colitis—J. A. BARGEN, Rochester
Typing Pneumococci—H. A. REIMANN, Minneapolis
Bronchiectasis and Lung Abscess—Lipiodol—EVERETT K. GEER and D. GRETH GARDINER, St. Paul
Peripheral Vascular Disease—GEORGE E. BROWN and BAYARD T. HORTON, Rochester
Congenital Anomalies of the Kidney—E. A. BOYDEN, Minneapolis
Primary Tuberculosis in Childhood—X-ray Films—J. R. MCNUTT, Duluth
Cauterization of Cervix—L. W. BARRY, St. Paul
Schick Test—C. A. STEWART, Minneapolis
Technic of Examination of the Blood Smear—C. H. WATKINS and F. J. HECK, Rochester
Method of Decompression in Simple Intestinal Obstructions—O. H. WANGENSTEEN and J. R. PAINE, Minneapolis
Professional Pharmacy as Applied to the Physicians—Under the auspices of the Inter-professional Relationships Committee of Hennepin County

GENERAL ASSEMBLY

11 A. M.

Presentation of Officers

Davis Method of Prostate Resection, with Moving Pictures—THEO. M. DAVIS, Greenville, S. C.
Results of Prostatic Resection—H. C. BUMPUS, JR., Rochester
Cystoscopic Prostatectomy—A Further Report—FREDERIC E. B. FOLEY, St. Paul

GENERAL ASSEMBLY

Surgical Hall—1 P. M.

Observations on Arterial Hypertension—RALPH MAJOR, Kansas City
Discussion—GEORGE E. BROWN, Rochester
Discussion—E. T. BELL, Minneapolis

CLINICS

Neurology—E. M. HAMMES, St. Paul
Dermatology—HENRY NICHOLAS KLEIN, St. Paul
Cardiology—C. N. HENSEL, St. Paul; RALPH MAJOR, Kansas City
Surgery—HARRY ZIMMERMANN, St. Paul
Pediatrics—T. L. BIRNBERG, St. Paul

FIRST-AID CLINIC FOR MINNESOTA HIGHWAY PATROLMEN

Medical Hall—1 P. M.

KENNETH BULKLEY, *Presiding Officer*, Minneapolis
The Equipment Necessary for the First-aid Treatment of Fractures—ROSCOE C. WEBB, Minneapolis
Cuts and Bruises—J. J. RYAN, St. Paul
Head Injuries in Automobile Accidents—ADOLPH HANSON, Faribault
Hemorrhages—F. J. PLONDKE, St. Paul
First-aid Treatment to Common Injuries—MYRON O. HENRY, Minneapolis

FRACTURE CLINIC—Medical Hall

Demonstration and Discussion of Fractures at the Hip, Elbow and Ankle by the St. Paul Sub-committee of the General Fracture Committee of the American College of Surgeons—A. R. COLVIN, *Presiding Officer*, St. Paul

Fractures at the Hip—Wallace H. Cole and Geo. A. Williamson, St. Paul
Fractures at the Ankle—Victor P. Hauser and Willard S. Howard, St. Paul
Fractures at the Elbow—C. C. Chatterton and C. Curry Bell, St. Paul

SCIENTIFIC CINEMA—1 P. M.

Same Program as Tuesday Afternoon

SCIENTIFIC EXHIBITS

Minnesota State Sanatorium
Demonstrations of Radiologic Examinations of Patients and of the Indians in Minnesota—H. A. Burns, Superintendent, Ah-Gwah-Ching
Lymanhurst School for Tuberculous Children, City of Minneapolis
Demonstration of Tuberculosis in Children—F. E. Harrington, Department of Health, Minneapolis; J. A. Myers, Lymanhurst School, Minneapolis
Minnesota Radiologic Society
Radiologic Exhibit—B. R. Kirklin, President, Rochester; Gage Clement, Vice President, Duluth; Leo G. Rigler, Secretary-Treasurer, Minneapolis
The Mayo Foundation for Medical Education and Research. This exhibit is being shown at the meeting of the American Medical Association at New Orleans this year
Surgery of the Colon and Rectum—Fred W. Rankin, John de J. Pemberton, L. A. Buie, C. F. Dixon, A. S. Graham
Diagnosis and Medical Treatment of the Colon and Rectum—J. A. Bargen, C. W. Brown, H. M. Weber
The Coronary Circulation—Merritt B. Whitten
Coronary Occlusion and Myocardial Infarction—A. R. Barnes
Plastic Surgery. Illustrations before and after treatment with Automatic Projector—Gordon B. New, F. A. Figi
Diet Research—W. C. Alvarez
An Adequate Diet. A representative will be present to answer questions and discuss various diets—Mary Foley
Ketogenic Diet—Its Use in Idiopathic Epilepsy—H. F. Helmholz and C. J. Barborka, Rochester
The Work of the Medical School
Statistics and Charts—R. E. Scammon, Minneapolis
Economics Committee, Minnesota State Medical Association
Distribution of Population, Wealth, and Physicians in Minnesota—N. O. Pearce, Minneapolis
Cancer Institute
Wm. A. O'Brien, Minneapolis
University of Minnesota
Fundus Photography. Department of Ophthalmology, University of Minnesota.
Tularemia. Charts of Distribution in Animals and of Animal Cycles. Wild Animal Specimens, Intermediate Insect Hosts, Pathological Specimens—R. G. Green, Minneapolis
Comparative Pathology. Division of Veterinary Medicine—C. P. Fitch, Chief, St. Paul
Women's Auxiliary
Mrs. James Blake, President, Hopkins
Glen Lake Sanatorium
Methods of Treating Pulmonary Tuberculosis—Staff of Glen Lake Sanatorium, Oak Terrace
Genito-urinary Tuberculosis—Gilbert J. Thomas and T. J. Kinsella, Oak Terrace
Ano-rectal Lesions in the Tuberculous—W. K. Fansler and C. K. Petter, Minneapolis
Minnesota and Ramsey County Public Health Associations
"The Doctor Sees the Case First."
Education Material for Distribution in the Field of Tuberculosis and Heart Disease

MEDICAL BROADCAST FOR THE MONTH

The Minnesota State Medical Association Morning Health Service

The Minnesota State Medical Association broadcasts weekly at 11:15 o'clock every Wednesday morning over Station WCCO, Minneapolis and Saint Paul (810 kilocycles or 370.2 meters).

Speaker: William A. O'Brien, M.D., Associate Professor of Pathology and Preventive Medicine, Medical School, University of Minnesota.

The program for the month of May will be as follows:

May 4—Personal Hygiene—Care of the Body.
May 11—Boils and Carbuncles.
May 18—Mucous Colitis.
May 25—Fibroid Tumors of the Uterus.

AMERICAN ASSOCIATION FOR THE STUDY OF GOITER

The annual meeting of the American Association for the Study of Goiter will take place at Hamilton, Ontario, June 14, 15, 16, 1931.

The program provides for hospital clinics beginning at 7:15 each morning and so-called day clinics from 10 o'clock on. Many surgeons whose names are associated with the goiter problem in Canada and the United States appear on the program. Minnesota participants include Drs. C. H. Mayo, H. S. Plummer and F. W. Rankin of Rochester, and C. O. Rice of Minneapolis.

NORTHWESTERN PEDIATRIC SOCIETY

The annual meeting of the Northwestern Pediatric Society was held at the Town and Country Club, St. Paul, Minnesota, on March 30, 1932. Twenty-four members were present. Dinner was served at 7 P. M. At 8 P. M. the meeting was called to order by Dr. Samuel Amberg, President of the Society.

The following names were proposed for membership: Dr. Emanuel S. Lippman by Dr. S. J. Huenekens and Dr. Charles L. Steinberg by Dr. T. L. Birnberg. Both were elected to membership.

The Treasurer's report showed a balance in the Treasury on March 30, 1932, of $378.20.

The following officers were elected for the ensuing year: Dr. Irvine MacQuarrie, president; Dr. Alexander Stewart, secretary-treasurer.

The invitation to the Society from Herbert Bigelow to visit his Certified Milk Farm was introduced by Dr. Frank Hedenstrom. After some discussion the acceptance of the invitation was left to the discretion of the officers of the Society.

The scientific program consisted of an address by Dr. Dwight E. Minnich, Professor of Zoology, University of Minnesota, on "Some Aspects of Human Heredity," which was extremely well received and instructive, and was freely discussed by many members of the Society.

Alexander Stewart, M.D.
Secretary-Treasurer.

RED RIVER VALLEY SOCIETY

Two North Dakota physicians, Dr. Henry Rudd of Grand Forks and Dr. Russell Gates of Minot, addressed the spring meeting of the Red River Valley Medical Society and its Auxiliary at the Hotel Crookston in Crookston, April 12.

Dr. Rudd's subject was "The Diagnosis and Treatment of Lateral Sinus Thrombosis." Dr. Gates, who is chief roentgenologist of the Northwest Clinic, discussed "Case Histories with Radiological Findings."

Dinner was served.

RICE COUNTY SOCIETY

Dr. M. S. Henderson, president of the State Medical Association, addressed the Rice County Medical Society on "Fractures" Thursday evening, April 7, at the Faribault Clinic rooms.

Other speakers on the same program were Dr. F. J. Savage, Saint Paul, whose subject was "Your Fifteen Dollars," and Dr. E. A. Meydering of Saint Paul, secretary of the State Association, who discussed medical economics.

SOUTH DAKOTA STATE MEDICAL MEETING

The fifty-first annual session of the South Dakota State Medical Association will be held at Langford, South Dakota, June 20, 21, and 22, 1932. An invitation is extended to the members of the Minnesota State Medical Association to attend.

UPPER MISSISSIPPI VALLEY SOCIETY

The winter meeting of the Upper Mississippi Valley Medical Society was held at Brainerd, January 27, with a large attendance and varied program.

The scientific program included a talk by Dr. F. G. Hedenstrom of Saint Paul on "Prophylaxes of Common Contagious Diseases," a moving picture film on "Spinal Anesthesia," a talk by Dr. James K. Anderson of Brainerd on "Treatment of Anal Fissure and Hemorrhoids."

An informal discussion of the Shoulders plan for veterans' insurance was a feature of the evening with Dr. W. W. Will, Bertha; Dr. G. J. Badeaux, Brainerd; Dr. Hedenstrom, and Dr. Anderson leading the discussion.

The following meeting places were selected for the year's meetings: Bemidji for the spring meeting; Little Falls for the fall meeting, which is to be held jointly with the Stearns-Benton County Medical Society; and Brainerd for the winter annual meeting.

WOMEN'S AUXILIARY
Minnesota State Medical Association

President—Mrs. James Blake, Hopkins
Chairman Press and Publicity—Mrs. Glen R. Matchan, Minneapolis
Editor—Mrs. Horatio B. Sweetser, Jr., Minneapolis

ST. LOUIS COUNTY AUXILIARY

On St. Patrick's Day the Duluth Women's Auxiliary were entertained by Mesdames Nicholson, Elias, and Forbes, at a luncheon. The purpose was to raise money for the Auxiliary's milk fund for needy families.

PARK REGION AUXILIARY

The Park Region Medical Society and the Auxiliary met jointly on April 13. The meeting was held at the River Inn, and during the dinner Mrs. James Blake spoke on the work of the Auxiliary. After the dinner the doctors adjourned for a scientific meeting, while a social hour was enjoyed by the Auxiliary. Mrs. C. O. Estrem of Fergus Falls is president of the Auxiliary.

STATE AUXILIARY

County presidents who have not filled out and returned nomination blanks sent them by Mrs. Baxter, should do so immediately. The nominating committee, composed of Mrs. Stephen H. Baxter, of Hennepin County, Chairman; Mrs. R. F. Meyers, Rice County; Mrs. J. C. Rothenburg, Redwood-Brown; Mrs. J. J. Gelz, Stearns-Benton; Mrs. C. K. Williams, Ramsey County, will meet the morning of May 23.

PROGRAM FOR STATE CONVENTION

Monday, May 23, 1932

Technical Exhibits—(Open from 6 until 8 P. M.)

AUDITORIUM THEATER

The Community Hospital—EDWARD A. FITZPATRICK, Dean Marquette University, Milwaukee
The American Legion—E. V. CLIFF, Ortonville
The Public—F. R. BIGELOW, St. Paul
The Doctor—DR. OLIN WEST, Chicago

Tuesday, May 24

Dutch Treat Luncheon—Women's City Club—12:30 P. M.
Greetings—DR. M. S. HENDERSON
—DR. GEORGE EARL
Executive Board members and visiting Auxiliary members all welcome
Executive Board Meeting—2:00 P. M.
Auditorium
All reports to be read at this meeting. All doctors' wives welcome.

BANQUET—Lowry Hotel—7:00 P. M.

Wednesday, May 25

GENERAL SESSION—Auditorium—9:00 A. M.

Report of the Executive Board Meeting
Round Table Discussion—"Problems of Everybody"—Led by DR. O. E. LOCKEN, DR. S. H. BOYER, DR. CARL B. DRAKE, MRS. R. N. JONES, MRS. H. M. BLEGEN, MRS. J. W. STUHR
Mental Hygiene—DR. LOUISA KERSCHBAUMER, St. Peter State Hospital
Echoes from New Orleans Meeting—MRS. SHERMAN S. HESSELGRAVE, St. Paul
Election of Officers

ANNUAL LUNCHEON—Palm Room, St. Paul Hotel

1 P. M.

Music
"Adult Education"—R. R. PRICE, Extension Division, University of Minnesota, Minneapolis

WOMAN'S AUXILIARY TO THE AMERICAN MEDICAL ASSOCIATION

Tenth Annual Meeting

New Orleans
May 9-13, 1932

Headquarters: Jerusalem Temple, 1137 St. Charles Ave.

Preliminary Program

Monday, May 9, 1932

6:00 P.M.—National Board Dinner and Pre-Convention Meeting (for Board Members only), Orleans Club, 5005 St. Charles Ave.

Tuesday, May 10, 1932

9:00 A.M.—General Meeting. Mrs. Arthur B. McGlothlan *presiding.*
12:30 P.M.—Buffet Luncheon.

2:00 P.M.—Walk through Vicux Carre, with Guides. Starting from the Patio Royale.
8:00 P.M.—General Meeting of the American Medical Association. Auditorium.

Wednesday, May 11, 1932

9:00 A.M.—General Meeting.
12:30 P.M.—*Auxiliary Luncheon. Southern Yacht Club.
2:30 P.M.—Post-Convention Board Meeting. Southern Yacht Club.
New Orleans Country Club
8:30 P.M.—Divertissements in the Garden.
10:00 P.M.—Buffet Supper. Negro Spirituals—Courtesy of the Woman's Auxiliary to the Louisiana State Medical Society.

Thursday, May 12, 1932

9:00 A.M.—General Meeting. Mrs. Walter Jackson *presiding.*
10:00 to 10:50 } Special Round Table Conferences.
11:00 to 11:50 }
12:00 M. —Buffet Luncheon.
1:00 P.M.—*Trip to Oak Alley Plantation; visiting Spillway. Returning at 6 P. M. (Round trip, $2 per person.)
or
2:00 P.M.—*Round-trip over Lake Pontchartrain, via New Bridges. ($2 per person.)
or
2:30 P.M.—*Trip to Versailles Plantation, Battle Field of New Orleans; Docks and Wharves. (Round trip, $1 per person.)
or
2:30 P.M.—*Delgado Museum and City Park; Newcomb Art School and Audubon Park. (Round trip, $1 per person.)
or
2:30 P.M.—*Mayan Exhibit, Tulane University. (Round trip, 25c per person.)
9:00 P.M.—President's Reception and Ball. Auditorium.

Friday, May 13, 1932

9:00 A.M.—*Trip to Gulf Coast. Leaving L. & N. Station at 9:00 A. M., returning to New Orleans at 6:00 P. M. (Round trip, including luncheon and beautiful scenic drive along the coast, $6.00 per person.)
10.00 A.M.—Golf Tournament. Metairie Golf Club.

*Transportation paid by individual.
All trips start from Jerusalem Temple.

THROMBOPLASTIN-LEDERLE (For Hypodermic Injection) NOT ACCEPTABLE FOR N. N. R.

Because of the lack of evidence for the therapeutic value of thromboplastic substances other than those designed for external use, the Council on Pharmacy and Chemistry has omitted from New and Nonofficial Remedies, preparations of thromboplastin designed for subcutaneous or hypodermic administration. The Council reports that Thromboplastin-Lederle, admitted to New and Nonofficial Remedies, 1923, was stated in the advertising to be intended for both external and internal use; that the firm's thromboplastin proposed for external use has been accepted for New and Nonofficial Remedies; and that, since the firm still markets a thromboplastin solution to be administered by hypodermic injection, this preparation has been declared unacceptable. (Jour. A. M. A., January 9, 1932, p. 143.)

PROCEEDINGS MINNESOTA ACADEMY OF MEDICINE

Meeting of February 10, 1932

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, February 10, 1932. Dinner was served at 7 o'clock and the meeting was called to order at 8:15 by the President, Dr. J. C. Litzenberg. There were fifty-five members present.

Minutes of the January meeting were read by Dr. C. B. Drake, in the absence of the secretary.

The President then called on Dr. William Davis, of St. Paul, to read the minutes of the first meeting of the Academy, which was held on October 13, 1887, with Dr. Edward C. Spencer as Secretary. Dr. Davis presented the original copy of these minutes to the Academy and a motion was carried that they be placed in the permanent records of the Academy with this meeting of February 10.

The President announced the death of Dr. John Fulton, one of the oldest and best loved members of the Academy, and appointed a committee consisting of Dr. John Brown, Chairman, and Drs. S. M. White and J. S. Gilfillan, to draft resolutions on Dr. Fulton's death.

The following scientific program was given:

DR. KENNETH BULKLEY (Minneapolis) read his inaugural Thesis entitled "The Rôle of Oxyuris and Trichocephalus in the Etiology of Appendicitis." This was illustrated with numerous lantern slides showing serial sections of appendices. (To be published later in MINNESOTA MEDICINE.)

DISCUSSION

DR. W. R. RAMSEY (St. Paul): During the War I was in France for a year and a half with Dr. Park and our work was among the child refugees. Dr. Park came to the conclusion that these parasites were normal, at least in French children during the war; he found practically none of the children of that class that did not have pin worms. The very fact that it is so difficult to rid these children of these worms suggests in all probability that the appendix is involved and this may explain the recurrences of the worms. You think you have gotten rid of them and then so frequently they later recur. This may be the explanation.

DR. A. SCHWYZER (St. Paul): I think nearly all of us are a little stunned to see that the oxyuris on close examination should be so frequently found. I recall one little girl of 7 years. On opening her appendix, these oxyuris were so thick that they looked just like fur on the inside of the appendix. Still, the percentage in Dr. Bulkley's cases seems to me to be rather large. From now on we shall examine the removed appendices still more carefully than before. We always examine the appendix and make sections; but of course to make serial sections of the whole appendix is too much to ask of the laboratory man. It may be that we have not encountered oxyuris more often because we were not impressed with the necessity of looking very exactly for even young ones. Trichocepahlus dispar I have not seen. I should not have said anything on this subject but for one thing which I recently read in the Zentralblatt fur Chirurgie, where it was urged to section the appendices longitudinally. The appendix is rolled up tightly and is then sectioned longitudinally. In this way the microscopic examination is greatly simplified and overlooking areas of localized trouble is much more easily avoided.

DR. A. E. BENJAMIN (Minneapolis): I want to mention a case similar to the corollary by Dr. Bulkley in his paper. I recall one patient about eight years ago

who had worms and who had had various treatments, but with no results. Her appendix was always tender and I thought perhaps a good way to get rid of the worms was to take out the appendix. She has had no further trouble since the operation. We found numerous worms in the appendix. I believe this is of more common occurrence than we think; the trouble is not cured by the usual treatment because the worms are in the appendix.

DR. J. C. LITZENBERG (Minneapolis): It would not have been necessary to go back to the Zentralblatt for that method, for in the *American Journal of Obstetrics and Gynecology*, June, 1920, that method was given in the making of sections of the whole Fallopian tube, which is comparable to the appendix.

I had a very unusual case where there was tuberculosis of the uterus, vagina, and tubes. I coiled them all up together and found the lesions in the coiled specimen clear from the vulva to the end of the tube. It is a good method.

DR. A. E. WILCOX (Minneapolis) reported the following case of Extraperitoneal Cyst:

The patient, Mrs. C. M., age 39, was admitted to Eitel Hospital at 2 A. M. August 20, 1931. The present illness commenced on August 16, 1931, with uterine bleeding, at first slight in amount. The following day the bleeding ceased, and then continued irregularly, being bright red and, at times, dark clots only. The patient felt weak, with pain low in the back on both sides. The day of admission she experienced quite severe pain in the left lower quadrant of the abdomen. The pain was intermittent and was referred down the inside of the left thigh.

She had been operated for ectopic pregnancy, right side, in 1927. Her last menstrual period was May 25, 1931.

Examination showed a well-nourished woman of about the age given, complaining of severe pain on the left side. Pelvic examination showed marked tenderness and resistance in the left side, but no definite outline of any tumor could be made out, and mobility of the uterus was questionable on account of the pain. The cervix was negative.

Diagnosis was acute abdomen—(1) ectopic pregnancy; (2) ovarian cyst, possible torsion of pedicle.

Operation: On August 20, 1931, at 10:50 A. M., under spinal anesthesia (200 mgm. N_2O) a midline incision was made. There was no free fluid in the abdomen, but there were dense adhesions of the large and small bowel to the right cornu of the uterus and right broad ligament. A cyst about the size of a large lemon was found on the left side with its pedicle and the left tube twisted. This was located deep in the pelvis. A cyst about the same size was found on the right side. Adhesions of the large bowel were relieved and the serous covering of the bowel stitched with dulox sutures. Both cysts were removed without disturbing the other appendages. The right side had been operated (previous history). The wound was closed with plain for the peritoneum, chromic for the fascia, single layer reinforced with three or four interrupted sutures. Silkworm was used for the skin. The postoperative period was quite uncomfortable for four or five days, more so than usual, the patient having considerable distention, nausea, and repeated emesis; but from the fifth day post-operative until discharged her record shows nothing unusual and her temperature was normal. She was discharged Sept. 1, 1931, apparently well.

On September 8, 1931, she reported that since leaving the hospital backache and insomnia had been marked and recently she had pain in the left lower quadrant. In reviewing the case, I found she had complained some of pain in this area while in the hospital.

Examination showed the abdominal wound healed. On palpation a feeling of resistance was noted low in the left lower quadrant, and on vaginal examination not only a resistance to the left, but a palpable mass occupying a position to the left and downward from the uterus, which was smooth, slightly movable, and in size comparable to a four-months pregnant uterus. There had been no menstrual bleeding, but she reported some vaginal discharge. After the patient had urinated, the vaginal examination was repeated and the same findings were present, namely, a mass in the position of the uterus extending to the left and downward. Other examinations were negative.

On October 26, 1931, she reported that she had had one normal menstrual period. The same physical findings were present in regard to the mass. The leukocyte count was 12,000. No definite diagnosis was made, and exploratory operation advised. A scout X-ray film of the pelvis and mass was made, with negative deductions.

On November 6, 1931, under spinal anesthesia, a midline incision was made, dissecting out the previous operative scar. Upon opening the peritoneum above the mass, the omentum was found adherent to the parietal peritoneum. There was no free fluid in the abdomen. The left ovary appeared normal (evidently the cyst removed at the previous operation was of para-ovarian origin). The tube on the left side was distended with fluid (hydrosalpinx). This tube was removed. After a few adhesions to the surrounding structures were separated, the uterus could be brought up and inspected and it appeared to be normal although there were some adhesions on the right side.

The bladder was pushed over to the right side and backward, and the mass which had been felt previous to operation proved to be extraperitoneal and occupied a position to the left side of the bladder, in front of the uterus, and reached down to the symphysis pubis. The peritoneum was then closed above the mass, the abdominal muscles separated from the peritoneum, and the upper part of the mass came into view, which was somewhat regular, giving an impression of fluctuation. A line of cleavage was found and enucleation started. On the outer and anterior and also on the mesial side of this mass enucleation was more difficult as the adhesions were more dense. At one time the question of this mass being an obstructing diverticulum of the bladder was considered, but, inasmuch as it was extraperitoneal, this theory was discarded. A moderate sized needle was used to aspirate the mass and hemorrhagic fluid was obtained (a small amount for culture). Enucleation was then continued and eventually the mass was removed. It was about the size of a normal kidney and much the same shape. A small rupture occurred on its outer side during the process of enucleation, but this was clamped, no serious hemorrhage was encountered, and no definite connection of this mass to the other structures was found, it being enucleated en masse. The peritoneum was then closed with plain and a Penrose tube placed into the extraperitoneal bed from which the mass had been enucleated. The wound was closed with tier sutures, silkworm stay sutures, and clips for the skin. The postoperative recovery was progressive. The patient left the hospital November 19, 1931, and has remained well since.

Pathological report on specimen: Several sections were made of the wall and all show a rather uniform structure. The outer portion is composed of rather dense connective tissue with diffuse and focal infiltration of lymphocytes, plasma cells and an occasional neutrophile. The inner lining is covered with a membrane composed of red blood cells in various stages of disintegration. Just beneath this there is a band of cells showing marked phagocytosis of hemosiderin. No evidence of malignancy is seen. There are no structures resembling endometrial glands present. The sections have the appearance of a fibrous reaction to an

escape of free blood into the tissues. Diagnosis: encysted hematoma. (Wm. A. O'Brien, Pathologist.)

DISCUSSION

DR. J. L. ROTHROCK (St. Paul): It was my privilege to operate on a retroperitoneal cyst a little more than a year ago. These tumors of various kinds are not at all uncommon. In my case the tumor lay behind the cecum. At first I thought it might be a renal tumor but after further investigation we decided it probably was not. I thought of hypernephroma but it did not extend up as far as the kidney. I then thought it might be a cyst of the ovary with adhesions.

At operation we found this tumor was intraperitoneal, and lay behind the cecum. I divided the peritoneum over the cyst and then, to my surprise and satisfaction, it was the simplest thing in the world to enucleate it. It was attached by no blood vessels and had no pedicle. There was very little bleeding except where we divided the peritoneum over the cyst. It measured 15 by 12 by 9 cm., or a flattened oval in shape. It seemed to have a fluid which was dark in color and which was described as greyish brown. When it was opened, we found there were low papillary growths 1 cm. in diameter in one area of the cyst wall. The cyst wall was rather thin and showed nothing in particular. On microscopic examination this was found to be adenocarcinoma. This woman was 31 years old and the only symptom of which she complained was this tumor. A year after the operation there was no recurrence. I have not recently heard about her, but have written to inquire how she is.

One thing which makes me think the prognosis may not be so bad was that at no place had these papillary growths penetrated through the capsule. There were not many lymphatics leading from it. The chances for permanent cure were perhaps not so bad in that case.

DR. A. E. BENJAMIN reported a case in connection with the paper on "Nasal Suction Treatment of Postoperative Vomiting, Pain and Dehydration." (To be published in MINNESOTA MEDICINE.)

This patient is a young single man 22 years of age, five feet six and one-fourth inches tall, weight 138 pounds, and is employed as an electrician. His health has been fairly good in the past with the exception of having had children's diseases; infection of the left hand and wrist in 1927, which required lancing and drainage; pneumonia in 1928; and in November, 1931, he had another slight infection of the left wrist. He has had a few attacks of tonsillitis. His general habits are good. He smokes about half a package of cigarettes a day. His family history is essentially negative.

On November 15, 1931, at about 8 A. M., while out hunting, he carelessly put his No. 22 (long) cocked revolver back into the holster on his right side. The revolver went off and the bullet diagonally entered the lower right quadrant of the abdomen. He at once drove his car a mile and a half to a farm house for help. He was taken to Dr. Arey at Excelsior, who gave him a hypodermic of morphin and first aid treatment, and he was then rushed to the Northwestern Hospital.

X-rays of the abdomen, taken on the day of admittance, show a somewhat diffuse haziness over the entire abdomen. There is one area of density at the level of the crest of the right ileum which simulated a metallic foreign body. Conclusions: Definite evidence of fluid in the abdomen. Determination of the presence of a metallic foreign body is not definite due to a movement and slow exposure of the portable machine.

The patient seemed in fair condition, pulse 80, temperature 97.4°. Although there was a rigid abdomen, especially on the lower right, he complained of little pain or discomfort. There was dullness in the lower abdomen. Upon evacuation of the bladder, the urine contained no blood. He was not in distinct shock so an operation was determined upon and performed three hours after the accident.

Under local, gas and ether anesthesia a right rectus incision was made just inside and above the anterior superior spine. The omentum was protruding through the muscle bullet wound. The abdomen contained much blood and clots, and the contents of the bowel had escaped and mixed with this. Saline solution with a suction was used to wash out the fecal matter from the abdominal cavity. The ileum was injured and punctured in nine places. The punctures and rents occurred in various places for about three feet along this part of the bowel. One area consisted of an injury to the mesentery for about 2 inches, causing considerable hemorrhage in the abdomen. At this point the bowel wall was not punctured. At a second area 2 inches in extent the bowel wall was ripped open on the side opposite from the mesentery and near the end of this area three small punctures existed near each other, two of them within ¾ of an inch, about the size of a slate pencil. The bowel was punctured by the bullet in other areas about the same size. The cecum was injured about 4 inches upward along the ascending colon but the wall was not completely severed. The rest of the intestine was examined up to about the middle of the jejunum, as well as the sigmoid, rectum, and ascending colon, but no injury was found. The iliac vessels seemed to be intact and apparently there was no bleeding from that source. The bullet was not found. It may have entered the bowel and been later evacuated.

All the raw and lacerated areas were carefully stitched with Dulox, turning the raw edges in. The circulation in one area where the bowel had been greatly lacerated was somewhat impaired, but this area was stitched in such a way that the remaining portion seemed to be well supplied with functioning blood vessels. All the areas involved were brought within a small space just below the incision, the omentum covering these areas, and four Penrose drains extended into the pelvis below these injured coils. The abdomen was closed with chromic No. 1 with the muscle and peritoneum included. Four dermal stay sutures tied over a roll of gauze were put in the inner side of the incision. The skin was closed with chromic No. 0.

The patient stood the operation very well. There seemed to be very little shock. On the second day after the operation the patient's abdomen became distended and he complained of distress and pain in the back, and he had eructation of gas. A Levin catheter was then passed through the nasal cavity into the stomach and this was attached to a tube connected with an inverted suspended bottle filled with water. This bottle was connected to a bottle on the floor to permit continuous suction to remove the gas from the stomach. I have used a similar plan on cases in the past but was not able by that method to measure the gas removed or the fluids absorbed. Dr. Wangensteen, of the Surgical Department of the University Hospital, has employed a more elaborate method whereby the gas removed and the fluids absorbed can be measured. His plan I adopted in this case, with marked success, as will be noted on the symptom chart herewith. (The use of this continued suction apparatus was shown on the screen, as well as other charts with symptoms and progress.)

The urine was negative upon admittance to the hospital, but on the third day there was a slight trace of albumin, indican, many mucous threads, occasional epithelial cells, and two to six pus cells. On the fifth day albumin was still present and a rare hyaline cast, with ten to fifteen pus cells. On the twenty-first day there was again a slight trace of albumin.

The day after his operation his temperature went up to 102.8°, pulse 110, and respirations 28. For the next five days the temperature fluctuated between 100° and

102°, after which time it gradually declined so that on the 10th day it was normal and remained about normal until he left the hospital. Up to the tenth day his pulse was between 85 and 100, but after that day it remained practically normal. There were no respiratory complications.

This case demonstrated the benefits derived from the continuous suction apparatus, which has the following advantages: (1) relieves pain; (2) necessitates fewer hypodermics; (3) is a distinct psychological benefit; (4) prevents vomiting; (5) permits the patient to drink freely; (6) increases the comfort of the patient; (7) permits more rest and sleep; (8) reduces the temperature; (9) lessens intra-abdominal tension; (10) decreases the possibility of spreading peritonitis; (11) occasions earlier bowel function; and (12) hastens recovery and reduces mortality.

DISCUSSION

DR. ROTHROCK: Did I understand Dr. Benjamin correctly, that he did not pass the tube into the duodenum?

DR. BENJAMIN: It was put just into the stomach. I have some X-ray slides which may show that, although possibly not very clearly.

The meeting adjourned.

R. T. LAVAKE, M.D.
Secretary.

PROCEEDINGS MINNEAPOLIS SURGICAL SOCIETY

Meeting of March 3, 1932

The President, Dr. J. Frank Corbett, in the chair.

The following scientific program was given:

DR. ROSCOE C. WEBB presented the specimen and reported the case of a girl fifteen years of age first seen at 8 o'clock in the evening of Tuesday, June 24, 1930, with pain in the right lower quadrant of the abdomen which was cramplike and very severe. Her father had returned from a successful fishing trip on Saturday, four days previously, and she had eaten fish on Sunday and Monday. At two o'clock in the afternoon, six hours previously, while riding in an auto she began to have pains in the lower abdomen on the right side and the severity gradually increased until at the end of six hours the pains were very severe and the doctor was called to see her.

Her past history was unimportant. There was no previous history of gastrointestinal disturbance. She had had pyelitis four years previously.

The general physical examination was that of a well-developed girl who was entirely normal except for the abdomen. There was marked tenderness in the right lower quadrant extending well down toward the pelvis. There was marked rigidity throughout this tender area but no distention. The temperature was 100°, pulse 72, and respirations 20. The white blood count was 13,700 and the differential showed 69 per cent polymorphonuclears, 29 per cent small lymphocytes, and 2 per cent large mononuclears. The urine was normal.

The patient was operated upon by Dr. Webb at Northwestern Hospital about nine hours after the onset of symptoms as follows: Using nitrous oxide and ether anesthesia, a four-inch lower right rectus incision was made. On opening the peritoneum the small intestine which presented was found to be inflamed and on searching for the appendix turbid fluid was found in the right lower quadrant and also in the pelvis. The fluid was not walled off. A swab of the fluid was sent to the laboratory for smear and for cultures. The appendix was readily found and delivered and was moderately long and showed evidence of a previous inflammation but was not acutely inflamed at the time. The appendix was ligated and the stump was cauterized and inverted. A search was made for the cause of the peritonitis and the patient was placed in the Trendelenburg position after aspirating the fluid and the pelvic organs were examined visually. At the same time, about the level of the brim of the pelvis, he saw what appeared to be about one-half inch of number one catgut lying on the surface of one of the loops of intestines and on closer examination he found that this was lying on a Meckel's diverticulum which was only slightly inflamed near its tip. The Meckel's diverticulum was about the size of the thumb of an ordinary rubber glove and the object on the diverticulum was a fish bone which had perforated the diverticulum about one-half an inch from its tip with the sharp end sticking out and the larger end of the fish bone still within the lumen of the diverticulum, thus permitting a constant escape of the intestinal contents. The diverticulum was ligated and removed and the stump inverted with a double row of Lembert catgut sutures. A Penrose drain was placed in the pouch of Douglas and brought out at the lower angle of the wound. The wound was closed in tiers using dermal for the skin.

Convalescence was quite uneventful. The maximum temperature was 101°, pulse 108, and respirations 24. The drain was completely removed on June 29, five days after operation. The patient was discharged from the hospital on July 11, 1930.

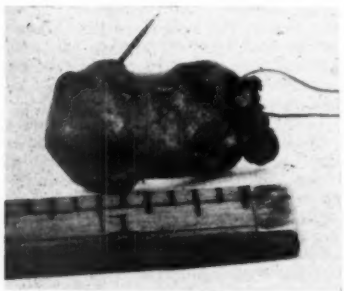
In the February, 1932, issue of the *Annals of Surgery*, under the Transactions of the Philadelphia Academy of Surgery, meeting of October 5, 1931, Dr. Walkling reported the case of a boy eight years of age admitted May 5, 1930. The patient had eaten fish three days before and on operation an abscess was found in the center of which there was a Meckel's diverticulum, perforated by a fish bone. Recovery occurred. Dr. Walking remarked that this condition was reported only once before. (Blanc, H.: Bull. et Mem. Soc. de Chirurg. de Paris, Vol. xxi, p. 378, 1929.) This patient, a man forty-one years of age, was operated upon in 1898. The patient's symptoms had begun ten days previously. After five days' observation the patient was operated upon and a hard fibrous mass was found and when freed was found to be a Meckel's diverticulum, which was resected. It was found to have a fish bone in its wall. Recovery was uneventful.

A woman forty-five years of age was reported in April, 1900, by Piquand and Grenet in the Bulletin and Memoirs of the Societe anatomie de Paris. She had had abdominal pains for one year, and eight days before admission her symptoms became acute. There was a large tender mass in the abdomen and she was observed for five days, at the end of which time she died in coma. There was a localized abscess, in the center of which was a Meckel's diverticulum perforated by a fish bone.

Hagler and Stewart, in the *Journal of the American Medical Association*, May 15, 1920, reported the case of a man aged thirty-nine years who had had abdominal pain for two days and the symptoms suggested acute appendicitis. On operation a Meckel's diverticulum was found in an omental mass and a fish bone was found perforating it. It was necessary to resect about six inches of the ileum. A general peritonitis developed and the patient died six days after admission. These authors stated that they had found reference to but two other cases of perforation of Meckel's diverticulum by a fish bone.

Dr. Webb stated that, in his search of the literature, he had been able to find but four other case reports of this rare condition and it would appear that this series of five cases is the largest number thus far collected. The diverticulum described by Meckel occurs in a very small percentage of cases. The percentage of humans who swallow fish bones is also small. How-

ever, when one operates for acute appendicitis with perfectly good reasons and a normal appendix is found, the diverticulum of Meckel should be kept in mind and a search made.



Meckel's diverticulum showing the fish bone in the position found at operation (actual size).

DR. E. A. REGNIER reported the following case of "Carcinoma of the Lower Ileum with Complete Intestinal Obstruction of Three Weeks' Duration":

The patient, Mr. C. G., male, aged fifty-two, a railroad brakeman, was admitted to General Hospital August 4, 1931. (Discharged Oct. 17, 1931.)

He had had intermittent cramp, colicky pains in the abdomen of several months' duration, more severe the past three weeks. There had been nausea and vomiting daily for the past two weeks; and he had had no stools for the past two weeks.

The onset of the illness had been gradual. The colicky pains began in the right side of the abdomen and radiated to the lower abdomen, and eventually the colic involved the entire abdomen. The patient said he had been hearing gurgling and tinkling sounds accompanying the colic. Under advice of his physician he took nothing but liquids by mouth, and also took daily enemas. The first week of his illness the stools were very small, and there had been none for two weeks. There had been no bloody stools.

He had had an appendectomy in 1929; otherwise his past history was non-essential. Gastrointestinal studies made in 1929 were reported normal.

The physical examination showed a white male, much undernourished, who appeared to be in very severe pain. The pupils were equal and reacted. The tongue was furred. Blood pressure was 138/86. The examination was entirely normal except for the loss of weight, marked abdominal distention, tympany throughout the abdomen, and loud metallic sounds audible on auscultation over the abdomen at the acme of peristalsis. Peristalsis was visible over the entire lower abdomen.

After attempting to determine the origin of the obstruction and partially replenish the fluid loss in this patient, the abdomen was explored under spinal anesthesia on the 8th day of August. There was a large amount of free fluid in the abdomen. The entire ileum was distended to a diameter of about four inches and the wall was markedly thickened. Due to terrific intra-abdominal pressure, several loops of the bowel had herniated through the foramen of Winslow. There was a constricting mass about five centimeters long and three centimeters in diameter completely obstructing the ileum about six inches above the ileocecal valve.

Laboratory findings on his admission to the hospital were: Wassermann negative. Urine showed a faint trace of albumin. Blood: Hb. 90 per cent, R. B. C. 4,500,000, W.B.C. 9,000; blood chlorides 396 mgms. per 100 c.c.; blood urea 22.2 mgm.; Van Slyke 62 per cent. Occult blood was found in two stool specimens.

The patient developed bronchial pneumonia following the first operation. He was very toxic for ten days. The enterostomy functioned perfectly and the patient was able to eat well and gained in weight.

Under general anesthesia the patient was operated on the 22nd day of September, at which time the terminal fifteen inches of ileum, the entire cecum and ascending colon to the mid-transverse colon was resected and an end-to-end anastomosis was done between the ileum and transverse colon.

Convalescence was very uneventful. The patient gained in weight rapidly and at the present writing has regained his normal weight.

Pathologist's report: Specimen consists of loops of bowel as described above. Six inches above the ileocecal valve the ileum was constricted and on opening shows a villous mass filling the lumen for 5 cm. An enlarged node is present in the mesentery. The ileum above the stricture measured 15 cm. in circumference.

Microscopic picture: The tumor has a papillary structure and consists of glandular tissue. There is dense fibrosis of submucosa and serosa which contains nests of deeply staining epithelium and atypical glandular structures. The muscular coat of the gut is enormously hypertrophied.

Diagnosis: Papillary adenocarcinoma of the terminal ileum.

The significant features of this case are (1) the duration of complete obstruction without fatal outcome, and (2) the rarity of the lesion.

In 17,000 autopsies at the University of Minnesota there were only five cases of carcinoma of the ileum. The diagnosis of obstruction in this case was very obvious. X-ray is of no help in locating these lesions and is usually contraindicated. In complete obstruction X-ray is of much help in ruling out other lesions, namely in the colon or stomach.

Rankin states that about three per cent of cancers of the intestinal tract occur in the small intestine. In a twenty-year period in the Mayo Clinic only fifty-five cases of cancer of the small intestine were reported. This type of tumor must be differentiated from the so-called carcinoid tumors of the small intestine, 80 per cent of which are benign.

Ewing divides cancer of the small intestine into those developing from carcinoid tumors, or from polyposis, or from true localized adenocarcinoma. From a review of the literature, the prognosis is poor. The Mayo Clinic reports no three-year cures.

DR. A. F. BRATRUD reported a case of "Meckel's Diverticulum in a Strangulated Hernia."

The patient, Mrs. A. M., was a female, aged 50, Swedish, occupation housewife. Her father and mother are dead of unknown cause. She has one brother, aged 63, living and well, and one sister living and well.

This patient was first seen by Dr. Bratrud on July 7, 1930. She had been seen ten days previously by Dr. Wahlquist, Minneapolis, for pain in the lower abdomen accompanied by nausea and vomiting. The pain began in the right lower abdomen and became cramp-like in character. She had been nauseated during the entire period of ten days. She vomited daily with the exception of three days. During the past four or five years she had been wearing a truss for a hernia in the right lower abdomen. Her appetite had always been good; bowels were regular. The urine was normal. Menstruation began at the age of thirteen, and had been regular up to the persent time, with the exception that now they occur every five or six weeks. She has had six children, three of which died during infancy; the other three are living and well. Since the present attack began ten days ago she has been constipated, but the bowels moved with an enema. She had had no night sweats.

Examination is that of a well-nourished and well-developed woman about fifty years of age. Her blood pressure is 153/90; pulse 95. The examination of the eyes, ears, nose and throat is normal, with the exception that her hearing is not very acute. There is no adenopathy and no enlargement of the thyroid. Breath sounds were normal in both chests, with the exception of a few moist râles at the left base. The heart is normal in outline but there is a soft systolic murmur at the apex. The abdomen is rather pendulous, with moderate distention and with a mass slightly larger than a hen's egg in the right inguinal region. This mass is very hard and firm and moderately tender to pressure. There is no fluctuation to be determined. It is not reducible. There is dulness in this mass on percussion. There is no other mass to be felt in the abdomen.

The reflexes were normal, and all motor function was normal. Urinalysis showed a faint trace of albumin, with a very slight reduction for sugar, and a large number of pus and red cells.

A diagnosis of strangulated right inguinal hernia was made on this patient when seen by Dr. Wahlquist on June 29, 1930, but the patient refused operation continually until July 7, 1930.

Operation was performed on July 7, 1930, at which time there was a mass 2.5×0.5 inches in length in the right inguinal region. This was very hard and very firm. Under local anesthesia, infiltration being made at a distance from the mass, a right inguinal incision was made. There was a peculiar greenish discoloration of edematous tissue surrounding this mass. It was very difficult to separate the tissues down to the mass and determine the character of same. A Farr spring retractor was placed in the wound and in so doing one of the arms of the retractor slipped and punctured the mass. There was an immediate discharge of gas which had a fecal odor. Wet packs were at once placed around the mass and the wound was washed with S. T. 37 solution. An opening was made above the inguinal incision in order to observe better the character of this mass, as this woman did not have a complete intestinal obstruction at any time. The incision was gradually brought to the neck of the mass, and at that point there was a gangrenous area which involved a loop of the ileum and part of its mesenteric attachment. A resection of the ileum and part of the mesentery which was gangrenous and an end-to-end anastomosis were performed. A number eight rubber glove was packed with gauze and this was placed within the abdominal cavity and the wound was strapped. No sutures were placed in the wound.

Pathological report: The specimen which was removed consisted of a large piece of tissue matted together with adhesions. The organ removed is hollow and lined with a folded mucous membrane. This is either intestine or a diverticulum from the intestine. There is a hard area which is being sectioned. This tissue shows a necrosis which has destroyed the organized tissue near the serous coat. Many pus cells and eosinophiles are present. The epithelial layer is made up of glands consisting of high columnar cells, containing mucus. I can't tell whether or not it is intestine or a diverticulum. (Floyd Grave, pathologist.)

Postoperative treatment consisted of normal saline solution intravenously, pantopon whenever necessary for pain, and ergot twice daily. Perfringens vaccine was given intramuscularly.

There was never any very severe reaction following the operation, but there was a very profuse purulent discharge from the wound. There was no nausea, vomiting, distention, nor pulmonary complications following the operation. By July 13, 1930, all of the gauze was removed from the glove and the glove was loosened. This was removed two days later. On July 18, 1930, there was still quite profuse drainage from the wound, but it was healing nicely and the edges were very clean. On August 4th, the wound was practically healed. There was practically no drainage at this time except from the granulation tissues. The bowels had been moving regularly since the date of her operation. She was discharged on August 4, with no evidence of a hernia. She was last seen September 10, 1930, at which time the wound was very well healed and there was but a very slight bulging in the operative wound. This could not be interpreted as a recurrent hernia. She has been free from any symptoms since her operation.

It was impossible in this case to determine whether this was a Meckel's diverticulum in an inguinal hernia, or a Richter's hernia. It was impossible, while making the dissection, to determine whether this was a hard tumor or a tumor consisting of a hollow viscus, until the mass was punctured by a retractor.

Dr. Bratrud wished particularly to emphasize the nice healing which results from this form of treatment of wounds and the complete absence of any reaction in the tissues surrounding the wound following an operation where it is so treated.

DISCUSSION (OF PRECEDING CASE REPORTS)

DR. A. T. MANN asked how large the mass was in Dr. Bratrud's case?

DR. BRATRUD stated it was about two and a half inches in diameter and round.

DR. MANN stated that these Meckel's diverticula are very interesting to him; he had seen four cases. There were several points he wished to bring out. In the first place it is almost impossible to make a diagnosis correctly before operation; and no one really knows that he has a Meckel's until he sees it. Dr. Mann suggested that in Dr. Bratrud's case it may have been bowel.

Dr. Mann further stated that a Meckel's diverticulum is subject to all the inflammations that the appendix is and is much more difficult to diagnose than trouble with the appendix. Besides that, it has all the troubles of the bands and cords and twists causing obstruction; so that when there is inflammation in a diverticulum one is quite likely to get more or less obstruction with it also. In regard to the degree of inflammation, one may get everything up to perforation in a Meckel's, and Meckel's occurs in one or two per cent of all people. For diagnosis, a Meckel's is much more free than the appendix and on account of its freedom and its larger size and poor blood supply, it is more apt to have a more rapid perforation than the appendix. The diagnosis is more difficult to make because it can be in more places than the appendix can. One knows just about the range an appendix can have. Then, too, if there is inflammation it is much less likely to be walled off than the appendix, so that, unless the Meckel's is pretty much up toward the midline, one can't even make a guess that it is a Meckel's which may be inflamed. R. M. Harbin, of Rome, Georgia, was formerly abroad with him, and Dr. Mann stated that he gets reports from his hospital each year. Dr. Harbin reported a year or so ago on over 2,600 cases of operations, and stated that the greatest cause of death was appendicitis (25 per cent), and the next greatest was obstruction of the bowel (16 per cent); but the point which interested Dr. Mann was that 10 per cent of these obstructions were due to Meckel's diverticula. A Meckel's, then, can give one the obstruction and, in addition, all the troubles that one encounters with the appendix, including foreign bodies; and the foreign bodies much more easily get into the Meckel's diverticulum. Dr. Mann said he has seen pins and also grape seed in the appendix and cited the case of one man who had eaten a whole basket of grapes at one sitting and at operation the acute appendix was found full of grape seeds.

Of late more cases of Meckel's are being reported. Peptic ulcers, similar to those of the stomach and

duodenum, have been reported. In some of these ulcer cases, heterotopia has been found and microscopic sections of the mucous membrane have shown mucous membrane identical in structure with that of the stomach. Some of these cases have been discovered because of large hemorrhages and melanotic stools. In other cases the hemorrhage is smaller but, because of the thin-walled gut, they lend themselves rather readily to perforation and extravasation.

In conclusion, Dr. Mann stated that the diagnosis of Meckel's is difficult until one gets into it; that the dangers are very much greater than those of appendicitis; and, if it is a case of inflammation, the perforation is much more rapid. There is more apt to be a spreading peritonitis and these latter cases result in more deaths than similar cases of appendicitis. Besides, they are often accompanied by intestinal obstruction, with strangulation, necrosis and gangrene. And in a considerable number, the necessity for an intestinal resection adds materially to the dangers.

Dr. S. R. Maxeiner said Dr. Webb's case of foreign body in a Meckel's diverticulum reminded him of a case he reported at the Western Surgical Association, of a patient who came to St. Mary's Hospital with a very acute abdominal complaint which was not entirely typical of appendicitis. At the onset of the complaint the patient was in North Dakota and was not seen by Dr. Maxeiner until three or four days after the beginning of the attack. On opening the abdomen, the appendix was found not to be the cause of the attack, but the sigmoid with an extremely redundant mesentery was lying on the right side of the pelvis. A fairly large mass presented which, when opened, was found to contain an abscess in the center of which was a toothpick lying freely in the abscess cavity and which had penetrated a diverticulum of the sigmoid. The abscess was largely on the right side because of the position of the sigmoid.

Dr. Maxeiner also reported a case of obstruction from Meckel's diverticulum operated upon by him at the Minneapolis General Hospital. He also encountered an acute diverticulitis in which the diverticulum was removed, and one case of diverticulitis had been encountered in which he had done no operation whatever because it appeared merely as a bulging area on the side of the ileum with free opening into the bowel and was causing no complaint.

Dr. O. H. Wangensteen stated that these were very interesting cases, and that the comment that he desired to make concerned only the features of bowel obstruction. The most outstanding consideration in bowel obstruction is the appalling mortality. In reported statistics it appears that the risk borne by one patient with acute intestinal obstruction equals that shared by ten patients having acute suppurative appendicitis. Whereas the potential danger to life of a perforated duodenal ulcer would appear to be far greater than of mere obstruction to the continuity of the bowel, the actual danger incurred by the patient with bowel obstruction as judged from the general mortality of these two disasters is twice as great.

The danger is largely that of delay. In a hospital whose resident and attending staff are "obstruction-minded," postoperative obstructions are early recognized. The complaint of these patients is usually that of "gas pains," which often go unheeded until vomiting occurs. The diagnosis of acute intestinal obstruction should be one of the easiest of acute disorders of the abdomen to recognize. If one will determine the presence or absence of *intestinal colic* by noting whether loud intestinal borborygmi are heard with the stethoscope at the acme of the pain, he has gone far to establish a diagnosis. The other colics of the abdomen, such as biliary, appendiceal, or renal colic, do not present loud intestinal noises, significant of increased peristaltic activity, at the height of the pain. When the presence of intestinal colic has been determined, it only remains to say whether this is acute intestinal obstruction, enterocolitis, food poisoning, abdominal allergy or simple "belly-ache," and on the general symptoms such as nausea, vomiting and diarrhea, a good appraisal or evaluation of the intestinal colic can usually be made.

Dr. Wangensteen said there were two therapeutic agents, the use of which he wished to discuss briefly. One is the employment of saline. It should be remembered that saline exhibits the virtues of a specific only in high intestinal obstruction. In low intestinal obstruction it is in no sense a specific, its greatest worth lying in combating dehydration. Dr. Wangensteen stated that it was not his observation that patients with low obstruction were improved very much as operative risks by a prolonged delay for saline administration. Only when the patient is badly dehydrated and the X-ray film indicates that the bowel distention is not great can prolonged delay be justified.

Dr. Wangensteen stated that since August, 1931, he had employed nasal catheter siphonage for decompressing the bowel in simple obstruction of the intestine without strangulation features. Of the seven cases seen since that time, all but one were successfully decompressed with nasal suction alone without operation. The third case was subjected to enterostomy after 12 hours suction when no appreciable diminution of the distention was visible on the X-ray film, and he convalesced smoothly. Since then Dr. Wangensteen stated that he had succeeded in decompressing a case exhibiting even more marked obstructive features. In the case in which enterostomy was done, the catheter could not be gotten into the duodenum.

The rationale upon which a decompression can be effected by this method, Dr. Wangensteen explained, resided in the fact that the chief source of intestinal gas is swallowed air. After the decompression is accomplished, in the absence of an intrinsic obstruction in the intestine, the intestinal continuity is automatically established.

Resection and primary anastomosis in the presence of a strangulated non-viable gut, Dr. Wangensteen felt to be a hazardous procedure. In such instances he thought it much wiser to exteriorize the devitalized bowel and establish the continuity by a secondary anastomosis. The combined risks of these two procedures he felt would not approximate the risk borne by the patient when a primary resection was done. In his monograph on bowel obstruction, Wilhelm Braun, of the Friedrichshain Hospital in Berlin, writes that their mortality in strangulated external hernia with non-viable gut in which resections were done was over 50 per cent.

Dr. J. A. Johnson stated that about ten years ago, in 1922, he first became interested in Meckel's diverticula. At that time he collected three cases in which a Meckel's diverticulum was the cause of intestinal obstruction. Since that time he had had no one other case. He felt it was a very interesting subject and he appreciated hearing the cases reported tonight. In connection with Dr. Webb's case, he wished to state that he did not know whether a fish bone is more likely to perforate the intestine than anything else. During past years he had the experience of seeing several cases of swallowed foreign body. One child had swallowed ten pins, and they all passed through without any accident. Two other children had swallowed open safety pins. On the other hand, one would think that swallowing of fish bones is not so common. He had seen one case which had perforated the intestine and caused an abscess in the abdominal wall, where the fish bone was found at operation. He wondered if fish bones more frequently perforated the bowel than other sharp foreign bodies. And where there is a Meckel's diverticulum and a fish bone perforating that diverticulum, Dr. Johnson thought was a rare case.

Dr. R. C. Webb thanked the members for their discussion but was not surprised that there was no one

in the society who had had a case of Meckel's diverticulum perforated by a fish bone even in this state which is so noted for its fishing.

Dr. Webb also referred to the method of drainage described by Dr. Bratrud and felt that it was noteworthy that the discussion did not show that Dr. Bratrud's enthusiasm was more general in the Society. Mikulicz, many years ago, drained many wounds by placing a gauze sack in the wound and stuffing it full of gauze. Gibson, about twenty years ago, modified Mikulicz's method by using a large piece of rubber-dam instead of the gauze sack. The rubber-dam makes the tampon much less painful and the folds about it and the holes in it afford satisfactory drainage. Dr. Webb presented a paper on this subject before this society nine years ago and he felt that Dr. Bratrud's use of a rubber glove was a very good substitute when operating in hospitals where the rubber-dam was not available. He felt that the surgeon who would try the use of this method of drainage would soon be brought to share Dr. Bratrud's enthusiasm.

Dr. William T. Peyton read his Inaugural Thesis entitled "Report of a Case of Tumor of the Thoracic Vertebra with Complete Paraplegia. Treatment with Radium with Complete Cure and Return of Function. Experimental Work Showing the Action of Radium on the Spinal Cord."

ABSTRACT

The cases here reported were cases of myeloma involving the thoracic vertebræ with compression of the spinal cord resulting in paraplegia.

The first case was treated by laminectomy and insertion of radium, this followed by high voltage X-ray therapy, with the result that the patient has been clinically free from symptoms up to the present time, eighteen and a half months after operation.

The second patient is one who had laminectomy only; this was followed by slight improvement. He is now receiving high voltage X-ray therapy. It is four months since the laminectomy was performed.

The results are reported of some experiments which were performed in an effort to determine the effect of radium upon the spinal cord of dogs. Photomicrographs of the cords of these animals removed after being exposed to different doses of radium are shown. Changes are produced in the meninges, and in the cord proper by this exposure to radium. The intensity of these reactions is directly proportional to the amount of radiation. The changes noted are a meningeal reaction over a localized area at the site of the implantation, characterized by infiltration of leukocytes. Changes in the cord proper are nerve cell injury and glial proliferation with smaller doses, but in larger doses there is nerve cell destruction, myelin degeneration, hemorrhages, and even fragmentation of the gray matter and focal necroses in the white matter. The maximum dose of radium placed extradurally which was tolerated without resulting paralysis was 1.7 millicuries.

DISCUSSION

Dr. S. H. Baxter said he was interested in Dr. Peyton's experimental work on the effects of radium on the tissue of the central nervous system. In considering these effects, it is necessary to bear in mind that radium, in its physical properties, is not a simple element and that its effects depend upon the manner in which it is applied. In the experimental work cited by Dr. Peyton, the radium was used in the form of emanation, in seeds, in which there is little filtration or protection against the alpha rays. This supposition is strengthened by the fact that, in the experiments cited, the destructive effect was in the immediate vicinity of the seeds. On the other hand in the operation which Dr. Peyton reported, the radium was applied in a metal needle so that although the dosage, measured in milligram hours, was a good deal greater than that which produced destructive effects when seeds were used, still there was apparently no harmful effect upon the cells of the spinal cord after exposure to the radium in the metal needle. Dr. Baxter said he had frequently exposed peripheral nerves to large amounts of radium heavily screened, without harmful effects upon the nerves, but he realized that the cells of the central nervous system were probably much more sensitive to radium than were the peripheral nerves. He asked Dr. Peyton whether he had any experimental evidence on the effects of radium, heavily screened and applied at some distance from the cord, upon the nerve cells.

Dr. Peyton (in closing) stated, in regard to filtration, that the alpha rays are filtered out in these seeds because it is 0.2 millimeters of gold. The nickel-steel is 0.5 millimeters, but gold is a better filter than nickel-steel. As far as the use of radium in the axilla is concerned, it is generally admitted that the peripheral nerves are very radio resistant. Dr. Peyton said that apparently very little actual work has been done on the effect of radium on the peripheral nerves.

As far as the cord getting more radiation from these needles which he had used in the clinical case, in comparison to the dogs which were experimented on, Dr. Peyton said it really got less because he had put these out at a distance; and the effect of radiation decreases so greatly with distance that when he figured this out in terms of skin erythema doses he found the clinical case actually got less.

The annual election of officers took place at a business meeting which was held immediately following the scientific program, and the following officers were elected for next year: President, Dr. Kenneth Bulkley; vice president, Dr. Martin Nordland; secretary-treasurer, Dr. F. A. Olson. Council members: Dr. R. C. Webb was elected in place of Dr. White, whose term expired; Dr. A. E. Regnier was elected to fill Dr. Nordland's unexpired term.

The meeting adjourned.

H. O. McPheeters, M.D., *Secretary.*

BOOK REVIEWS

BOOKS RECEIVED FOR REVIEW

Medical Formulary. E. Quin Thorton, M.D. Assistant Professor of Materia Medica of Jefferson Medical College. Philadelphia. 352 pages. Price, $2.50, flexible binding. Philadelphia: Lea & Febiger, 1932.

Psyllium Seed: The Latest Laxative. Dr. J. F. Montague. Medical Director Montague Hospital for Intestinal Ailments, etc. 170 pages. Illus. New York: Montague Hospital for Intestinal Ailments, 1932.

Modern General Anesthesia. James G. Poe, M.D. Lecturer on General Anesthesia in Medical and Dental Departments of Baylor University, etc. 231 pages. Illus. Price, $2.50 cloth. Philadelphia: F. A. Davis Company, 1932.

The Way of Health Insurance. A. M. Simons and Nathan Sinai. Research Staff of Committee on the Study of Dental Practice of the American Dental Association. 215 pages. Price, $2.00, cloth. Chicago: The University of Chicago Press, 1932.

GROWTH AND DEVELOPMENT OF THE CHILD. Part III. NUTRITION. Report of the Committee on Growth and Development, Kenneth D. Blackfan, M.D., Chairman, White House Conference on Child Health Protection. 532 pages. Price, $4.00, cloth. New York: The Century Co., 1932.

FERTILITY AND STERILITY IN MARRIAGE. Th. H. Van de Velde, M.D., formerly Director of the Gynecological Clinic at Haarlem, Holland. Translated by F. W. Stella Browne. 494 pages. Illus. Price, $7.50. New York: Covici-Friede, 1932.

NUTRITION SERVICE IN THE FIELD. CHILD HEALTH CENTERS: A SURVEY. White House Conference on Child Health Protection. 196 pages. Price, $2.00, cloth. New York: The Century Company, 1932.

OBSTETRIC EDUCATION. White House Conference on Child Health Protection. 302 pages. Price, $3.00, cloth. New York: The Century Company, 1932.

THE HUMAN VOICE. Leon Felderman, M.D. First Edition. Cloth. Price $2.50. 294 Pages, with illustrations. New York: Henry Holt and Company, 1931.

This handy-size book, written in popular style, supplies topographical knowledge of the upper air passages and their common disorders. It is offered as an auxiliary to vocal instruction and has been compiled to bridge over the difficulties between vocal teacher and pupil: to bring them closer together on the common ground of knowledge. The anatomical descriptions are given in terms understandable to the layman, and the line drawings, excepting those pertaining to the nose, are good.

The author maintains that vocalization and its esthetic qualities cannot satisfactorily be taught to large groups. Each individual pupil must have his particular teacher.

In the chapter on swimming, he states that indoor or tank swimming is far less dangerous than outdoor swimming. He stresses the dangers of forcibly blowing the nose right after swimming. Those individuals with a history of discharging ears, perforation of the drum membrane, or sinus infection should be regarded as bad swimming risks unless examination by a competent otolaryngologist proves otherwise.

"The removal of the tonsils when diseased adds materially to the welfare of the patient and does not affect the voice."

The author denies the harmful effects of tobacco.

This book should be of value to anyone interested in the training of the voice.

The publisher is to be congratulated on the high quality of print and paper employed.

H. J. ROTHSCHILD, M.D.

JUDGMENT ON BIRTH CONTROL. R. de Guchteneere. Price $2.00. New York: The MacMillan Company, 1931.

This book, written by a Belgian physician, gives a broad view of the entire subject of birth control. It explains Malthusianism and gives the facts concerning that doctrine. Next it takes up Neo-Malthusianism and the various modifications of it which have led to the present widespread Birth Control movement. In the next four chapters the subject of birth control is discussed from the economic, eugenic, medical and moral aspects. Throughout these chapters the judgment against the Birth Control movement is based on scientific reason in support of natural law and demands the consideration of science and common sense without regard to religious teaching.

The remaining fifteen pages show the parallel between these conclusions and the Catholic view of birth, and stress the rôle of religion as opposed to paganistic individualism in bringing the human will into conformity with natural law in the interest of humanity.

CHARLOTTE A. STICKNEY, M.D.

FOR SALE—To close estate: Completely equipped Minneapolis physician's office, including Fluoroscope, X-ray, Stereoscopic Viewer, Metabolor. Phone number and same space is desired. Cash or reasonable terms. Howard P. Quealy, Administrator, 754 McKnight Building, Minneapolis.

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FOR SALE—Equipment of Granger Clinic—X-ray outfit, microscopes and laboratory equipment, sterilizers, cabinets, tables, etc., metabolism apparatus, gas machine, and other articles; also large library. Retiring from practice. Address Dr. Chas. T. Granger, Rochester, Minn.

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MINNESOTA STATE MEDICAL ASSOCIATION

COUNTY SOCIETY ROSTER

BLUE EARTH COUNTY MEDICAL SOCIETY

Regular meetings, last Monday of each month
Annual meeting, last regular meeting of year

President
Butzer, J. A.—Mankato

Secretary
Huffington, H. L.—Mankato

Andrews, J. W.—Mankato
Andrews, R. N.—Mankato
Benham, E. W.—Mankato
Black, William—Mankato
Butzer, J. A.—Mankato
Cosgriff, J. A.—Olivia
Dahl, G. A.—Mankato
Denman, A. V.—Mankato
Eckstein, A. W.—Mankato
Edwards, Ralph T.—Elysian
Franchere, F. W.—Lake Crystal
Fugina, G. R.—Mankato
Hassett, R. G.—Mankato
Hielscher, J. A.—Mankato
Holbrook, J. S.—Mankato
Howard, M. I.—Mankato
Huffington, H. L.—Mankato
Juliar, R. O.—St. Clair
Kemp, A. F.—Mankato
Liedloff, A. G.—Mankato
Lloyd, H. J.—Mankato
Miller, V. I.—Mankato
Osborn, Lida—Mankato
Schlesselman, J. T.—Mankato
Schmidt, P. A.—Good Thunder
Sohmer, A. E.—Mankato
Stillwell, W. C.—Mankato
Vezina, J. C.—Mapleton
Wentworth, A. J.—Mankato
Williams, Hugh O.—Lake Crystal

BLUE EARTH VALLEY MEDICAL SOCIETY

Faribault and Martin Counties
Regular meetings, May and October
Annual meeting, October

President
Henderson, A. J.—Kiester

Secretary
Hunt, R. C.—Fairmont

Bailey, H. B.—Fairmont
Blanchard, H. G.—Fairmont
Boysen, H.—Welcome
Butz, J. A.—Monterey
Chambers, W. C.—Blue Earth
Cooper, M. D.—Winnebago City
Durgin, F. L.—Winnebago
Folta, John—Ceylon
Gardner, V. H.—Fairmont
Heimark, J. J.—Fairmont
Henderson, A. J.—Kiester
Hunt, F. N.—Fairmont
Hunt, R. C.—Fairmont
Hunte, A. F.—Bylos, Arizona
Jacobs, A. C.—Elmore
Johnson, H. P.—Fairmont
Logan, F. W.—Blue Earth
Luedtke, G. H.—Fairmont
McGroarity, J. J.—Easton
Miller, H. A.—Fairmont
Mills, J. L.—Winnebago
Richardson, W. J.—Fairmont
Sommer, A. W.—Elmore
Vaughan, V. M.—Truman
Wilson, C. E.—Blue Earth

CAMP RELEASE DISTRICT MEDICAL SOCIETY

Chippewa, Lac Qui Parle, Sibley, Renville and Yellow Medicine Counties
Regular meetings, Fourth Thursday of January, April, July, October
Annual Meeting, October

President
Penhall, F. W.—Morton

Secretary
Dordal, J.—Sacred Heart

Adams, R. C.—Bird Island
Bacon, R. S.—Montevideo
Bergh, L. N.—Montevideo
Billings, R. E.—Franklin
Brand, W. A.—Redwood Falls
Burns, M. A.—Milan
Cole, H. B.—Redwood Falls
Cress, E. E.—Boyd
Dordal, J.—Sacred Heart
Flinn, T. E.—Redwood Falls
Flower, W. Z.—Minneapolis
Foshager, H. T.—Clara City
Gaines, E. C.—Buffalo Lake
Hauge, M. I.—Clarkfield
Hauge, M. M.—Clarkfield
Herbert, W. L.—Maynard
Holmberg, L. J.—Canby
Johnson, C. M.—Dawson
Johnson, H. M.—Dawson
Johnson, O. H.—Echo
Jordan, L. S.—Granite Falls
Kilbride, J. S.—Canby
Lee, Walter N.—Madison
Lima, Ludvig—Montevideo
Mesker, G. H.—Olivia
Mitchell, A. B.—Lansing, Mich.
Nelson, M. S.—Granite Falls
Olson, W. P.—Gaylord
Passer, A. A.—Olivia
Penhall, F. W.—Morton
Roust, H. A.—Montevideo
Smith, L. G.—Montevideo
Stemsrud, A. A.*—Dawson
Tangen, G. M.—Canby
Westby, Magnus—Madison
Westby, Nels—Madison

CLAY-BECKER COUNTY MEDICAL SOCIETY

Annual meeting, December

President
Bottolfson, B. T.—Moorhead

Secretary
Heimark, J. H.—Moorhead

Aborn, W. H.—Hawley
Archibald, F. M.—Mahnomen
Bergheim, M. C.—Hawley
Bottolfson, B. T.—Moorhead
Carman, J. E.—Detroit Lakes
Ellingson, A. R.—Detroit Lakes
Gosslee, G. L.—Moorhead
Hagen, O. J.—Moorhead
Heimark, J. H.—Moorhead
Humphrey, E. W.—Moorhead
Larsen, O. O.—Detroit Lakes
Larson, A. L.—Detroit Lakes
Meighen, J. W.—Ulen
Rutledge, L. H.—Detroit Lakes
Sinnison, C. W.—Hawley
Soine, T. S.—Barnesville
Thornby, H. J.—Moorhead
Thysell, F. A.—Moorhead

DODGE COUNTY MEDICAL SOCIETY

Annual meeting, August

President
Baker, H. R.—Hayfield

Affeldt, D. E.—Kasson
Baker, H. R.—Hayfield

EAST CENTRAL MINNESOTA MEDICAL SOCIETY

Anoka, Isanti, Kanabec, Mille Lacs and Sherburne Counties
Regular meetings, November, May, August
Annual meeting, November

President
Cooney, H. C.—Princeton

Secretary
Schoofs, G. E.—North Branch

Brownstone, Manuel—Sandstone
Callahan, F. F.—Pokegama
Cooney, H. C.—Princeton
Dredge, H. P.—Sandstone
Ehmke, W. C.—Willow River
Flom, A. O.—Chisago City
Halpin, J. E.—Rush City
Hedenstrom, L. H.—Cambridge
Heseltine, V. G.—Taylors Falls
Holmes, A. E.—Rush City
Kelsey, C. G.—Hinckley
Kooiker, H. J.—Milaca
Nethercott, E. G.—Pine City
Norrgard, H. T.—Milaca
Pearson, W. T.—Finlayson
Peterson, A. A.—Mora
Phelps, A. G.—St. Paul
Roehlke, A. B.—Elk River
Schoofs, G. E.—North Branch
Stephan, E. L.—Hinckley
Stratte, A. K.—Pine City
Swennes, O. S.—Wahkon
Swenson, Charles—Braham
Truog, C. P.—Lindstrom
Vik, Melvin—Onamia
Vrooman, F. E.—St. Francis
Zeien, Thomas—North Branch

*Deceased.

FREEBORN COUNTY MEDICAL SOCIETY

Regular meetings, quarterly
Annual meeting, December

President
Palmer, W. L. ..... Albert Lea

Secretary
Freligh, W. P. ..... Albert Lea

Branham, D. S. ..... Albert Lea
Burns, H. D. ..... Albert Lea
Butturff, C. R. ..... Freeborn
Calhoun, F. W. ..... Albert Lea
Folken, F. G. ..... Albert Lea
Freeman, J. P. ..... Albert Lea
Freligh, W. P. ..... Albert Lea
Gamble, J. W. ..... Albert Lea
Gamble, P. M. ..... Albert Lea
Gamble, R. M. ..... Albert Lea
Gullixson, A. ..... Albert Lea
Kaasa, L. J. ..... Albert Lea
Kamp, B. A. ..... Albert Lea
Leopard, B. A. ..... Albert Lea
Manley, L. V. ..... Albert Lea
Palmer, C. F. ..... Albert Lea
Palmer, W. L. ..... Albert Lea
Schultz, J. A. ..... Albert Lea
Whitson, S. A. ..... Alden

GOODHUE COUNTY MEDICAL SOCIETY

Annual meeting, December

President
Williams, M. R. ..... Cannon Falls

Secretary
Steffens, L. A. ..... Red Wing

Aanes, A. M. ..... Red Wing
Anderson, S. H. ..... Red Wing
Brusegard, J. F. ..... Red Wing
Claydon, D. R. ..... Red Wing
Claydon, L. E. ..... Red Wing
Cremer, M. H. ..... Red Wing
Fortney, G. O. ..... Zumbrota
Johnson, A. E. ..... Red Wing
Jones, A. W. ..... Red Wing
Liffrig, W. W. ..... Goodhue
McGuigan, H. T. ..... Red Wing
Peterson, J. A. ..... Red Wing
Smith, M. W. ..... Red Wing
Steffens, L. A. ..... Red Wing
Vaaler, T. ..... Cannon Falls
Williams, M. R. ..... Cannon Falls

HENNEPIN COUNTY MEDICAL SOCIETY

Regular meetings, first Monday of each month
Annual meeting, October

President
Barron, Moses ..... Minneapolis

Secretary
Hansen, Erling W. ..... Minneapolis

Alexander, H. A. ..... Minneapolis
Aling, C. P. ..... Minneapolis
Allen, H. W. ..... Minneapolis
Allison, R. G. ..... Minneapolis
Almquist, H. E. ..... Minneapolis
Altnow, H. O. ..... Minneapolis
Andersen, A. G. ..... Minneapolis
Andersen, S. C. ..... Minneapolis
Anderson, Arnold S. ..... St. Paul
Anderson, D. D. ..... Minneapolis
Anderson, Edward D. ..... Minneapolis
Anderson, Ernest R. ..... Minneapolis
Anderson, F. J. ..... Minneapolis
Anderson, J. K. ..... Minneapolis
Anderson, K. W. ..... Minneapolis
Anderson, Phillip A. ..... Minneapolis
Anderson, W. S. ..... Minneapolis
Andreassen, E. C. ..... Minneapolis
Annis, H. B. ..... Minneapolis
Arey, H. C. ..... Excelsior
Arvidson, C. G. ..... Minneapolis
Aune, Martin ..... Minneapolis
Aurand, W. H. ..... Minneapolis
Avery, J. F. ..... Minneapolis
Baken, M. P. ..... Minneapolis
Baker, A. T. ..... Minneapolis
Baker, E. L. ..... Minneapolis
Baker, Looe ..... Minneapolis
Barber, J. P. ..... Minneapolis
Barron, Moses ..... Minneapolis
Baas, G. W. ..... Minneapolis
Baxter, S. H. ..... Minneapolis
Bayard, H. F. ..... Minneapolis
Beard, A. H. ..... Minneapolis
Beard, R. O. ..... Minneapolis
Bedford, E. W. ..... Minneapolis
Bell, E. T. ..... Minneapolis
Bell, J. W. ..... Minneapolis
Benedict, E. E. ..... Minneapolis
Benjamin, A. E. ..... Minneapolis
Benn, F. G. ..... Minneapolis
Berkwitz, N. J. ..... Minneapolis
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Bessesen, W. A. ..... Minneapolis
Blake, James ..... Hopkins
Blaustone, H. H. ..... Minneapolis
Blumenthal, Jacob ..... Minneapolis
Bockman, M. W. H. ..... Minneapolis
Boies, L. R. ..... Minneapolis
Booth, A. E. ..... Minneapolis
Boreen, C. A. ..... Minneapolis
Borgeson, E. J. ..... Minneapolis
Bouman, H. A. ..... Minneapolis
Boynton, Ruth ..... Minneapolis
Bracken, H. M. ..... Minneapolis
Bratrud, A. F. ..... Minneapolis
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Brown, Edward J. ..... Minneapolis
Bryant, O. R. ..... Minneapolis
Bulkley, Kenneth ..... Minneapolis
Bullard, Mattie J. ..... Minneapolis
Butler, John ..... Minneapolis
Buzzelle, L. K. ..... Minneapolis
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Cabot, G. S. ..... Minneapolis
Cabot, V. S. ..... Minneapolis
Cady, L. H. ..... Minneapolis
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Cameron, Isabell ..... Minneapolis
Camp, W. E. ..... Minneapolis
Campbell, L. M. ..... Minneapolis
Campbell, O. J. ..... Minneapolis
Campbell, R. A. ..... Minneapolis
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Carey, J. B. ..... Minneapolis
Carlaw, C. M. ..... Minneapolis
Carlson, Lawrence ..... Minneapolis
Caron, R. P. ..... Minneapolis
Cavanor, F. T. ..... Minneapolis
Chamberlain, H. E. ..... Minneapoils
Cheleen, S. J. ..... Minneapolis
Cherry, C. H. ..... Minneapolis
Chesley, A. J. ..... Minneapolis
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Cohen, S. S. ..... Oak Terrace
Condit, W. H. ..... Minneapolis
Cook, H. W. ..... Minneapolis
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Dahl, E. O. ..... Minneapolis
Dahl, J. A. ..... Minneapolis
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Daniel, L. M. ..... Minneapolis
Dart, L. O. ..... Minneapolis
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Dewar, J. E. ..... Minneapolis
Deziel, G. ..... Minneapolis
Diehl, H. S. ..... Minneapolis
Diessner, H. D. ..... Minneapolis
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Dornblaser, H. B. ..... Minneapolis
Dorsey, G. C. ..... Minneapolis
Doxey, G. L. ..... Minneapolis
Doyle, L. O. ..... Minneapolis
Drake, C. R. ..... Minneapolis
Dreisbach, N. ..... Minneapolis
Duff, E. R. ..... Minneapolis
Dunlap, E. H. ..... Minneapolis
Dunn, G. R. ..... Minneapolis
Duryea, Marbry ..... Minneapolis
Dutton, C. E. ..... Minneapolis
Dworsky, S. D. ..... Minneapolis
Egilsrud, Kristian ..... Minneapolis
Ehrenberg, C. J. ..... Minneapolis
Ehrlich, S. Paul ..... Minneapolis
Eitel, G. D. ..... Minneapolis
Ellison, D. E. ..... Minneapolis
Emond, A. J. ..... Minneapolis
Erb, F. A. ..... Minneapolis
Erdmann, C. A. ..... Minneapolis
Erickson, R. F. ..... Minneapolis
Ericson, J. G. ..... Minneapolis
Ericson, R. M. ..... Minneapolis
Evans, E. T. ..... Minneapolis
Evans, R. D. ..... Minneapolis
Everlof, J. L. ..... Minneapolis
Exley, E. W. F. ..... Minneapolis
Fahr, Geo. E. ..... Minneapolis
Fansler, W. A. ..... Minneapolis
Farr, R. E. ..... Hopkins
Feeney, J. M. ..... Minneapolis
Fenger, E. ..... Oak Terrace
Fetterly, Warren ..... Minneapolis
Fink, L. W. ..... Minneapolis
Fink, W. H. ..... Minneapolis
Fitzgerald, D. F. ..... Minneapolis
Fjeldstad, C. Alford ..... Minneapolis
Flagstad, Albert E. ..... Minneapolis
Fowler, L. H. ..... Minneapolis
Fox, John M. ..... Minneapolis
Fredericks, G. M. ..... Minneapolis
Friedell, A. ..... Minneapolis
Funk, V. K. ..... Oak Terrace
Gammell, J. H. ..... Minneapolis
Gardner, E. I. ..... Minneapolis
Geist, F. S. ..... Minneapolis
Giere, E. O. ..... Minneapolis
Giere, J. C. ..... Minneapolis
Giere, R. W. ..... Benson
Giessler, Paul W. ..... Minneapolis
Gilles, F. I. ..... Minneapolis
Ginsberg, Harry ..... Minneapolis
Goldberg, I. M. ..... Minneapolis
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Graves, Floyd ..... Minneapolis
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Greene, W. P. ..... Minneapolis
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Gronvall, Paul R. ..... Minneapolis
Gunderson, Nels A. ..... Minneapolis
Gustafson, H. T. ..... Minneapolis
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Hagen, G. L. ..... Minneapolis
Haggard, G. D. ..... Minneapolis
Hall, J. M. ..... Minneapolis
Hall, S. S. ..... Minneapolis
Hallberg, C. A. ..... Minneapolis
Hamel, A. L. ..... Minneapolis
Hamilton, A. S. ..... Minneapolis
Hamlin, G. B. ..... Minneapolis
Hammond, A. J. ..... Minneapolis
Hannah, H. B. ..... Minneapolis
Hansen, C. O. ..... Minneapolis
Hansen, Erling W. ..... Minneapolis
Hansen, Olga S. ..... Minneapolis
Hanson, H. James ..... Minneapolis
Hanson, H. V. ..... St. Paul
Hanson, W. A. ..... Minneapolis
Hare, E. R. ..... Minneapolis
Harrington, C. D. ..... Minneapolis
Harrington, F. E. ..... Minneapolis
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Hastings, D. R. ..... Minneapolis
Haverfield, Addie R. ..... Minneapolis
Hawkinson, R. P. ..... Minneapolis
Hayes, J. M. ..... Minneapolis
Head, Douglas P. ..... Minneapolis
Head, G. D. ..... Minneapolis
Hearn, W. O. ..... Minneapolis
Hedback, A. E. ..... Minneapolis
Heim, R. R. ..... Minneapolis
Helk, H. H. ..... Minneapolis
Hendrickson, J. F. ..... Minneapolis

*Deceased.

Henry, C. E. Minneapolis
Henry, M. O. Minneapolis
Herbolsheimer, A. J. Minneapolis
Herbst, W. P. Minneapolis
Herman, A. L. Minneapolis
Hiebert, J. P. Minneapolis
Higbee, P. A. Minneapolis
Higgins, J. H. Minneapolis
Hill, Eleanor J. Minneapolis
Hirschfelder, A. D. Minneapolis
Hirschfield, Adolph Minneapolis
Hirshfield, F. R. Minneapolis
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Hurd, Annah Minneapolis
Hutchinson, C. J. Minneapolis
Hymes, Charles Minneapolis
Hynes, James Minneapolis
Hynes, J. E. Minneapolis

Irvine, H. G. Minneapolis
Irwin, A. F. Minneapolis

Jackson, C. M. Minneapolis
Jennings, F. L. Oak Terrace
Jennings, Mary H. Minneapolis
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Johnson, James A. Minneapolis
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Johnson, Norman Minneapolis
Johnson, R. A. Minneapolis
Johnson, Selmar M. Minneapolis
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Jones, G. M. Minneapolis
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King, Harry T. Minneapolis
King, W. R. Minneapolis
Kinsella, T. J. Oak Terrace
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Kistler, C. M. Minneapolis
Knight, R. R. Minneapolis
Knight, R. T. Minneapolis
Koch, J. C. Minneapolis
Koepcke, G. M. Minneapolis
Koller, H. M. Minneapolis
Koller, L. R. Minneapolis
Kremer, Walter J. Minneapolis
Kriedt, Daniel Minneapolis
Kucera, F. J. Hopkins
Kucera, W. J. Minneapolis

Lajoie, J. M. Minneapolis
Lapierre, A. P. Minneapolis
Lapierre, C. A. Minneapolis
Lapierre, J. T. Minneapolis
Larson, C. M. Minneapolis
Laurent, A. A. Minneapolis
La Vake, R. T. Minneapolis
Lazar, H. L. Minneapolis
Leavitt, H. H. Minneapolis
Lebowske, J. A. Minneapolis
Lee, H. M. Minneapolis
Lee, T. G. Minneapolis
Leggett, Elizabeth A. Minneapolis
Leland, H. R. Minneapolis
Leland, M. N. Minneapolis
Leonard, L. J. Minneapolis
Levine, N. M. Minneapolis
Lillehei, E. J. Minneapolis
Lind, C. J. Minneapolis
Lindquist, R. H. Minneapolis
Linner, H. P. Minneapolis
Linton, W. B. Minneapolis
Litman, A. B. Minneapolis
Litzenberg, J. C. Minneapolis
Logefeil, R. C. Minneapolis
Long, Jesse Minneapolis
Loomis, E. A. Minneapolis
Lundgren, A. C. Minneapolis
Lundquist, E. F. Minneapolis
Lynch, M. J. Minneapolis
Lyon, E. P. Minneapolis
Lyon, J. D. Minneapolis
Lysne, Henry Minneapolis

McCarthy, Donald Minneapolis
McCartney, J. S. Minneapolis
McDaniel, Orianna Minneapolis
McEachran, A. Minneapolis
McFarland, A. H. Minneapolis
McGandy, R. F. Minneapolis
McGeary, G. E. Minneapolis
McIntyre, George Minneapolis
McKinlay, C. A. Minneapolis
McKinley, J. C. Minneapolis
McKinney, F. S. Minneapolis
McPheeters, H. O. Minneapolis

MacDonald, A. E. Minneapolis
MacDonald, D. A. Minneapolis
MacDonald, I. C. Minneapolis
Mach, Frank B. Minneapolis
Macnie, J. S. Minneapolis
Magiera, Estelle A. Minneapolis
Maland, C. O. Minneapolis
Mann, A. T. Minneapolis
Marcley, W. J. Minneapolis
Mariette, E. S. Oak Terrace
Mark, D. B. Minneapolis
Martinson, C. J. Wayzata
Matchan, G. R. Minneapolis
Matthews, Justus Minneapolis
Mattill, P. M. Oak Terrace
Maxeiner, S. R. Minneapolis
May, W. H. Minneapolis
Merkert, C. E. Minneapolis
Merkert, G. L. Minneapolis
Meyer, E. L. Minneapolis
Michael, J. C. Minneapolis
Michelson, H. E. Minneapolis
Milton, J. S. Minneapolis
Moen, J. K., Jr. Minneapolis
Moir, W. W. Minneapolis
Moorhead, M. B. Minneapolis
Moren, Edwin Minneapolis
Moriarty, Cecile R. Minneapolis
Morrison, A. W. Minneapolis
Murphy, Ignatius J. Minneapolis
Myers, J. A. Minneapolis

Nathanson, M. H. Minneapolis
Nelson, C. P. Minneapolis
Nelson, Harvey Minneapolis
Nelson, H. S. Minneapolis
Nelson, O. E. Minneapolis
Newhart, Horace Minneapolis
Nordin, G. T. Minneapolis
Nordland, Martin Minneapolis
Noth, H. W. Minneapolis
Nystrom, Ruth Minneapolis

Oberg, C. M. Minneapolis
O'Brien, W. A. Minneapolis
O'Donnell, J. E. Minneapolis
Olson, F. A. Minneapolis
Olson, Olaf A. Minneapolis
Olson, R. G. Minneapolis
Owre, Oscar Minneapolis

Parks, A. H. Minneapolis
Patterson, W. E. Minneapolis
Paulsen, E. L. Minneapolis
Pearce, N. O. Minneapolis
Pederson, Harold Minneapolis
Pederson, R. M. Minneapolis
Peppard, T. A. Minneapolis
Perry, R. St. J. Minneapolis
Petersen, J. R. Minneapolis
Petersen, Thorvald Minneapolis
Peterson, H. W. Minneapolis
Peterson, O. H. Minneapolis
Peterson, W. C. Minneapolis
Petit, L. J. Minneapolis
Pettit, C. W. Minneapolis
Pfunder, M. C. Minneapolis
Phelps, K. A. Minneapolis
Platou, E. S. Minneapolis
Pollard D. W. Minneapolis
Poppe, F. H. Minneapolis
Pratt, F. J. Minneapolis
Pratt, J. A. Minneapolis
Preine, I. A. Minneapolis
Prim, J. A. Minneapolis
Proshek, C. E. Minneapolis

Quinby, T. F. Minneapolis
Quist, H. W. Minneapolis

Reed, C. A. Minneapolis
Rees, S. P.* Minneapolis
Regnier, E. A. Minneapolis
Reynolds, J. S. Minneapolis
Richardson, F. S. Minneapolis
Richdorf, L. F. Minneapolis
Ridgway, Florence Minneapolis
Rigler, L. G. St. Paul
Rishmiller, J. H. Minneapolis
Rizer, R. I. Minneapolis
Roan, C. M. Minneapolis
Robb, E. F. Minneapolis
Roberts, T. S. Minneapolis
Roberts, W. B. Minneapolis
Robitshek, E. C. Minneapolis
Rochford, W. E. Minneapolis
Rodda, F. C. Minneapolis
Rodgers, C. L. Minneapolis
Rosen, S. Minneapolis
Rosenwald, R. M. Minneapolis
Rowe, W. H. Minneapolis
Rucker, C. W. Minneapolis
Rucker, W. H. Minneapolis
Rud, N. E. Minneapolis
Rudell, G. L. Minneapolis
Russeth, A. N. Minneapolis

Sadler, W. P. Minneapolis
St. Cyr, K. J. Osseo
Salt, C. G. Minneapolis
Sawatzky, W. A. Minneapolis
Schaaf, F. H. K. Minneapolis
Schaefer, W. G. Minneapolis
Scheldrup, N. H. Minneapolis
Schlesselman, George Anoka
Schmidt, G. F. Minneapolis
Schmitt, A. F. Minneapolis
Schmitt, S. C. Minneapolis
Schottler, M. E. Minneapolis
Schussler, O. F. Minneapolis
Schwartz, V. J. Minneapolis
Schwyzer, Gustav Minneapolis
Schwyzer, R. Minneapolis
Scott, F. H. Minneapolis
Seaberg, J. A. Minneapolis
Seashore, Gilbert Minneapolis
Seham, Max Minneapolis
Selleseth, Iver Minneapolis
Sessions, J. C. Minneapolis
Shapiro, M. J. Minneapolis
Simons, Jalmar Minneapolis
Simpson, E. D. Minneapolis
Simpson, J. D.* Minneapolis
Siperstein, D. M. Minneapolis
Sitar, R. F. Minneapolis
Sivertsen, Ivar Minneapolis
Slocumb, Maude S. Minneapolis
Smith, A. M. Minneapolis
Smith, Arthur E. Minneapolis
Smith, H. R. Minneapolis
Smith, N. M. Minneapolis
Soderlind, R. T. Minneapolis
Solhaug, S. B. Minneapolis
Spratt, C. N. Minneapolis
Stelter, L. A. Minneapolis
Stenstrom, Annette T. Minneapolis
Stewart, C. A. Minneapolis
Stewart, R. I. Minneapolis
Stomel, Joseph Minneapolis
Strachauer, A. C. Minneapolis
Strout, E. S. Minneapolis
Sturre, J. R. Minneapolis
Sundt, M. Minneapolis
Swanson, Cephas Minneapolis
Swanson, R. E. Minneapolis
Sweetser, H. B., Sr. Minneapolis
Sweetser, H. B., Jr. Minneapolis
Sweetser, Theodore Minneapolis
Sweitzer, S. E. Minneapolis
Swendseen, C. G. Minneapolis

Taft, John O. Minneapolis
Tanner, A. C. Minneapolis
Taylor, Rood Minneapolis
Ternstrom, O. H. Minneapolis
Thomas, George E. Minneapolis
Thomas, George H. Minneapolis
Thomas, Gilbert J. Minneapolis
Thompson, H. H. Minneapolis
Tingdale, A. C. Minneapolis
Trueman, H. S. Minneapolis
Tunstead, H. J. Minneapolis
Turnacliff, D. D. Minneapolis
Tyrrell, C. C. Minneapolis

Ude, W. H. Minneapolis
Ulrich, H. L. Minneapolis
Undine, C. A. Minneapolis
Urner, J. A. Minneapolis

Vik, A. E. Minneapolis
Vogtel, M. A. Minneapolis
Voyer, E. O. Minneapolis

Wahlquist, H. F. Minneapolis
Waldron, C. W. Minneapolis
Wall, C. R. Minneapolis
Wangensteen, O. H. Minneapolis
Wanous, E. Z. Minneapolis
Ward, A. W. Minneapolis
Ward, P. A. Minneapolis
Warham, T. T. Minneapolis
Watson, J. A. Minneapolis
Webb, R. C. Minneapolis
Weisman, S. A. Minneapolis
Welles, H. J. Minneapolis
Wethall, A. G. Minneapolis
Wetherby, Macnider Minneapolis
Weum, T. W. Minneapolis
White, S. Marx Minneapolis

*Deceased.

White, Willard D.....Minneapolis
Widen, W. F.....Minneapolis
Wiese, H. F. B.....Minneapolis
Wilcox, A. E.....Minneapolis
Wilder, R. L.....Minneapolis
Wilken, P. A.....Minneapolis
Wilkerson, V. A.....Minneapolis
Willcutt, Clarence.....Minneapolis
Williams, H. L.*.....Minneapolis
Williams, Robert.....Minneapolis
Winther, Nora M. C.....Minneapolis
Witham, C. A.....Minneapolis
Wittich, F. W.....Minneapolis
Wohlrabe, A. A.....Minneapolis
Wood, D. F.....Minneapolis
Woodworth, Elizabeth.....Minneapolis
Wright, C. B.....Minneapolis
Wright, C. D.....Minneapolis
Wright, F. R.....Minneapolis
Wynne, H. M. N.....Minneapolis
Yoerg, O. W.....Minneapolis
Zanger, Isabelle M.....Minneapolis
Zaworski, E. A.....Minneapolis
Zierold, A. A.....Minneapolis

HOUSTON-FILLMORE COUNTY MEDICAL SOCIETY

Regular meetings, quarterly
Annual meeting, October

President
Anderson, N. E.....Harmony

Secretary
Helland, J. W.....Spring Grove

Anderson, N. E.....Harmony
Beiswanger, R. H.....Wykoff
Belote, G. B.....Caledonia
Brekke, H. J.....Caledonia
Canfield, W. W.....Houston
Davis, I. Grant.....Rushford
Drake, F. A.....Lanesboro
Eby, C. B.....Spring Valley
Edward, George.....Canton
Grinnell, W. B.....Preston
Helland, G. M.....Spring Grove
Helland, J. W.....Spring Grove
Lannin, J. C.....Mabel
Nass, H. A.....Mabel
Nehring, J. P.....Preston
Onsgard, L. K., Jr.....Houston
Onsgard, L. K., Sr.....Houston
Palmer, R. N.*.....Lanesboro
Tierney, C. M.....Harmony
Williams, R. V.....Rushford
Woodruff, C. W.....Chatfield

KANDIYOHI-SWIFT COUNTY MEDICAL SOCIETY

Regular meetings, monthly at call
Annual meeting, December

President
Kaufman, Wm. C.....Appleton

Secretary
Scofield, C. L.....Benson

Anderson, R. E.....Willmar
Arnson, J. M.....Benson
Behmler, F. W.....Appleton
Branton, A. F.....Willmar
Branton, B. J.....Willmar
Daignault, Oscar.....Benson
Dowswell, W. J.....Kerkhoven
Fiksdal, M. J.....Willmar
Frisch, F. P.....Willmar
Frost, E. H.....Willmar
Giere, S. W.....Benson
Hodapp, R. J.....Willmar
Hutchinson, Henry.....New London
Jacobs, J. C.....Willmar
Jensen, H. H.....Atwater
Kaufman, W. C.....Appleton
Rains, J. M.....Willmar
Scofield, C. L.....Benson
Smith, B. F.....Willmar
Thompson, Arthur.....Raymond

LYON-LINCOLN COUNTY MEDICAL SOCIETY

Regular meetings, first Tuesday of month
Annual meeting, October

President
Golden, C. M.....Tyler

Secretary
Workman, H. M.....Tracy

Bossingham, O. N.....Lake Benton
Ford, B. C.....Marshall
Germo, Chas.....Balaton
Golden, C. M.....Tyler
Gray, F. D.....Marshall
Happe, L. J.....Marshall
Hermanson, P. E.....Hendricks
Hoidale, A. D.....Tracy
Jacquot, G. L.....Marshall
Olson, Archibald.....Hendricks
Persons, C. E.....Marshall
Robertson, J. B.....Cottonwood
Sanderson, E. T.....Minneota
Thordarson, Theo.....Minneota
Vadheim, A. L.....Tyler
Valentine, W. H.....Tracy
Workman, H. M.....Tracy
Workman, W. G.....Tracy
Yaeger, W. W.....Ivanhoe

McLEOD COUNTY MEDICAL SOCIETY

Annual meeting, January

President
Trutna, Thos. J.....Silver Lake

Secretary
Jensen, A. H.....Hutchinson

Clement, J. B.....Lester Prairie
Holm, H. H.....Glencoe
Jensen, A. H.....Hutchinson
Klima, W. W.....Stewart
Langhoff, A. H.....Glencoe
Ninneman, N. N.....Silver Lake
Sahr, W. G.....Hutchinson
Sheppard, Fred.....Hutchinson
Sheppard, P. E.....Hutchinson
Trutna, Thos. J.....Silver Lake

MEEKER COUNTY MEDICAL SOCIETY

Regular meetings, May, August, October
Annual meeting, December

President
Dulude, S. S.....Dassel

Secretary
Danielson, K. A.....Litchfield

Brigham, Frank.....Watkins
Danielson, K. A.....Litchfield
Dulude, S. S.....Dassel
Edwards, G. C.....GroveCity
Macklin, W. E., Jr.....Litchfield
O'Connor, D. C.....Eden Valley
Robertson, A. W.*.....Litchfield
Telford, V. J.....Litchfield
Wilmot, H. E.....Litchfield

MOWER COUNTY MEDICAL SOCIETY

Regular meetings, last Thursday of month
Annual meeting, December

President
Lommen, P. A.....Austin

Secretary
Sheedy, C. L.....Austin

Allen, A. W.....Austin
Allen, C. C.....Austin
Cobb, W. F.....Lyle
Coleman, F. B.....Austin
Cronwell, B. J.....Austin
Ewbank, J. N.....Minneapolis
Greene, H. H.....Austin
Grise, W. B.....Austin
Havens, J. G. W.....Austin
Hegge, O. H.....Austin
Hegge, R. S.....Austin
Henslin, A. E.....LeRoy
Hertel, G. E.....Austin
Leck, C. C.....Austin
Lommen, P. A.....Austin
McKenna, J. K.....Austin
Melzer, G. R.....Lyle
Mitchell, R. S.....Grand Meadow
Morrow, J. J.....Austin
Morse, M. P.....LeRoy
Rebman, E. C.....Austin
Robertson, P. A.....Austin
Sheedy, C. L.....Austin

*Deceased.

NICOLLET-LE SUEUR COUNTY MEDICAL SOCIETY

Regular meetings, March, June, September, December
Annual meeting, December

President

Traxler, F. J.....Henderson

Secretary

Daniels, J. W.....St. Peter

Aitkens, H. B.....Le Center

Covell, W. W.....St. Peter
Daniels, J. W.....St. Peter
Dodge, F. A.....Le Sueur
Ericson, Swan.....Le Sueur
Freeman, G. H.....St. Peter
Gully, R. J.....St. Peter
Hiniker, P. J.....Le Sueur
Holtan, Theodore.....Waterville
Kerschbaumer, Louisa.....St. Peter
Lenander, M. E.....St. Peter
McKechnie, Wilfred.....St. Peter
McKeon, J. O.....Montgomery
Peterson, M. C.....St. Peter
Strathern, F. P.....St. Peter
Traxler, F. J.....Henderson
Wolner, Oscar H.....St. Peter

OLMSTED COUNTY MEDICAL SOCIETY

Regular meetings, quarterly
Annual meeting, first Tuesday in November

President

Hartman, H. R.....Rochester

Secretary

Piper, M. C.....Rochester

Adson, A. W.....Rochester
Alderson, L. R.....Rochester
Allan, F. N.....Rochester
Allen, E. V.....Rochester
Allen, R. B.....Rochester
Allen, R. W.....Rochester
Allen, W. A.....Rochester
Alvarez, W. C.....Rochester
Amberg, Samuel.....Rochester
Anderson, C. M.....Rochester
Anderson, M. J.....Rochester
Atkinson, Walter.....Rochester
Balfour, D. C.....Rochester
Ball, R. G.....Rochester
Bannick, E. G.....Rochester
Barber, K. W.....Rochester
Barborka, C. J.....Rochester
Bargen, J. A.....Rochester
Barker, N. W.....Rochester
Barnes, A. R.....Rochester
Bartels, E. C.....Rochester
Benedict, W. L.....Rochester
Bennett, R. J., Jr.....Rochester
Berger, E. H.....Rochester
Berkman, D. M.....Rochester
Berkman, J. M.....Rochester
Binger, M. W.....Rochester
Boothby, W. M.....Rochester
Boudry, M. O.....Rochester
Bowing, H. H.....Rochester
Braasch, W. F.....Rochester
Brav, E. A.....Rochester
Broders, A. C.....Rochester
Brown, A. E.....Rochester
Brown, G. E.....Rochester
Brown, P. W.....Rochester
Brown, R. W.....Rochester
Brunsting, L. A.....Rochester
Buie, L. A.....Rochester
Bumpus, H. C.....Rochester
Burke, C. F.....Rochester
Burkley, G. G.....Rochester
Cabot, C. M.....Rochester
Cabot, Hugh.....Rochester
Cain, Edmund F.....Rochester
Caldwell, J. M., Jr.....Rochester
Cameron, M. C., Jr.....Rochester
Camp, J. D.....Rochester
Castleton, K. B.....Rochester
Chapman, C. B.....Rochester
Christensen, E. E.....Rochester
Christianson, H. W.....Rochester
Church, G. T.....Rochester
Cilley, E. I. L.....Rochester
Collins, D. C.....Rochester
Comfort, M. W.....Rochester
Conner, H. M.....Rochester
Cook, E. N.....Rochester
Costello, R. T.....Rochester
Counseller, V. S.....Rochester
Cox, F. W.....Rochester
Craddock, W. H.....Rochester
Craig, W. McK.....Rochester
Crenshaw, J. L.....Rochester
Crewe, J. E.....Rochester
Crisp, N. W.....Rochester
Curry, F. S.....Rochester
Cutts, R. E.....Rochester
Daniels, L. E.....Rochester
Davis, A. C.....Rochester
De Carle, D. W.....Rochester
Decker, F. H.....Rochester
Desjardins, A. U.....Rochester
Dixon, C. F.....Rochester
Dixon, R. K.....Rochester
Dolder, F. C.....Eyota
Donald, J. M.....Rochester
Down, H. I.....Rochester
Drips, D. G.....Rochester
Droegemueller, E. H.....Rochester
Dukelow, D. A.....St. Charles
Dunlap, H. F.....Rochester
Dunlop, J. G., Jr.....Rochester
Emmett, J. L.....Rochester
Emmons, W. F.....Rochester
Eusterman, G. B.....Rochester
Evans, V. L.....Rochester
Evarts, A. B.....Rochester
Faust, L. S.....Rochester
Fauster, J. U., Jr.....Rochester
Fawcett, C. E.....Stewartville
Figi, F. A.....Rochester
Finney, W. P., Jr.....Rochester
Foor, C. G.....Rochester
Ford, Frances A.....Rochester
Fortin, H. J.....Rochester
Fricke, R. E.....Rochester
Fulcher, O. H.....Rochester
Gaarde, F. W.....Rochester
Ghormley, R. K.....Rochester
Gibson, G. G.....Rochester
Giffin, H. Z.....Rochester
Gillespie, J. B.....Rochester
Goeckerman, W. H.....Rochester
Goldberg, S. L.....Rochester
Graham, A. S.....Rochester
Gray, H. K.....Rochester
Greene, C. H.....Rochester
Grimes, A. E., Jr.....Rochester
Habein, H. C.....Rochester
Haines, S. F.....Rochester
Hale, D. E.....Rochester
Hallenbeck, D. F.....Rochester
Harmeier, J. W.....Rochester
Harper, F. R.....Rochester
Harrington, S. W.....Rochester
Harris, M. T.....Rochester
Harrison, P. W.....Rochester
Hartman, H. R.....Rochester
Havens, F. Z.....Rochester
Hazen, S. F.....Rochester
Heazlett, W. A.....Rochester
Hebert, W. H. J.....Rochester
Heck, F. J.....Rochester
Helmholz, H. F.....Rochester
Hempstead, B. E.....Rochester
Hench, P. S.....Rochester
Henderson, M. S.....Rochester
Hewitt, Edith S.....Rochester
Heyerdale, O. C.....Rochester
Hilding, A. C.....Rochester
Hiltom, J. M.....Rochester
Hines, E. A., Jr.....Rochester
Hoerner, M. T.....Rochester
Horton, B. T.....Rochester
Howell, W. L.....Rochester
Hurt, Holcombe H.....Rochester
Hyde, T. L.....Rochester
Iber, F. C.....Rochester
Imes, P. R.....Rochester
Johnson, Ellsworth.....Rochester
Johnson, H. W. E.....Rochester
Johnson, W. R.....Rochester
Joyce, G. L.....Stewartville
Joyce, G. T.....Rochester
Judd, E. S.....Rochester
Kegaries, D. L.....Rochester
Keith, H. M.....Rochester
Keith, N. M.....Rochester
Kellum, E. L.....Rochester
Kennedy, R. L. J.....Rochester
Kepler, E. J.....Rochester
Kernohan, J. W.....Rochester
Kilbourne, A. F.....Rochester
Kirklin, B. R.....Rochester
Kirklin, O. L.....Rochester
Koelsche, G. A.....Rochester
Kullman, H. J.....Rochester
Larson, L. M.....Rochester
Larson, Paul N.....Rochester
Learmonth, J. R.....Rochester
Leddy, E. T.....Rochester
Lemon, W. S.....Rochester
Lendrum, F. C.....Rochester
Lester, G. L.....Rochester
Leven, N. L.....Rochester
Lillie, H. I.....Rochester
Lillie, W. I.....Rochester
Lochead, D. C.....Rochester
Logan, A. H.....Rochester
Loney, W. R. R.....Rochester
Love, J. G.....Rochester
Luden, Georgine.....Victoria, B. C., Can.
Lundy, J. S.....Rochester
McCarty, W. C.....Rochester
McCaughan, J. M.....Rochester
McCuskey, C. F.....Rochester
McKaig, C. B.....Pine Island
McQuiston, J. S.....Rochester
Magath, T. B.....Rochester
Magee, H. R.....Rochester
Major, S. G.....Rochester
Mann, F. C.....Rochester
Martin, W. J., Jr.....Rochester
Massey, B. D.....Rochester
Masson, D. M.....Rochester
Masson, J. C.....Rochester
Mayo, C. H.....Rochester
Mayo, C. W.....Rochester
Mayo, J. G.....Rochester
Mayo, W. J.....Rochester
Maytum, C. K.....Rochester
Meade, J. R.....Rochester
Meland, E. L.....Rochester
Mercer, S. R.....Rochester
Messick, J. M.....Rochester
Meyerding, H. W.....Rochester
Michie, T. C.....Rochester
Millet, R. F.....Rochester
Mills, S. D.....Rochester
Moench, L. Mary.....Rochester
Moersch, F. P.....Rochester
Moersch, H. J.....Rochester
Mohardt, J. H.....Rochester
Montgomery, Jimmie Ethel.....Rochester
Montgomery, Hamilton.....Rochester
Morey, J. B.....Rochester
Morgan, S. F.....Rochester
Morton, S. A.....Milwaukee, Wis.
Mroz, R. J.....Rochester
Mueller, S. C.....Rochester
Murray, S. E.....Rochester
Mussey, R. D.....Rochester
Nelson, W. L.....Rochester
New, G. B.....Rochester
Offutt, Susan R.....Rochester
Ohlinger, L. B.....Chicago, Ill.
O'Leary, P. A.....Rochester
Olson, E. A.....Pine Island
Overton, L. M.....Rochester
Parker, H. L.....Rochester
Patmos, Martin.....Rochester
Pattee, G. L.....Rochester
Pemberton, J. de J.....Rochester
Peterson, V. L.....Rochester
Phillips, J. R.....Rochester
Piper, M. C.....Rochester
Plummer, H. S.....Rochester
Plummer, W. A.....Rochester
Pollock, L. W.....Rochester
Popp, W. C.....Rochester
Prangen, A. D.....Rochester
Prickman, L. E.....Rochester
Priestley, J. B.....Rochester
Priestley, J. T.....Rochester
Quade, R. H.....Rochester
Randall, L. M.....Rochester
Rankin, F. W.....Rochester
Rentschler, E. B.....Rochester
Rieniets, J. H.....Rochester
Rivers, A. B.....Rochester
Rixford, E. L.....Rochester
Robertson, H. E.....Rochester
Robins, C. R., Jr.....Rochester
Robinson, L. W.....Rochester

Rogin, J. R.....Rochester
Rosenow, E. C.....Rochester
Rowntree, L. G.....Rochester
Ruffin, Willcox.....Rochester
Rynearson, E. H.....Rochester
Sanford, A. H.....Rochester
Scherer, L. R.....Rochester
Scherer, R. G.....Rochester
Serrurier, L. R.....Rochester
Shane, J. H.....Rochester
Sheldon, W. D.....Rochester
Slocumb, C. H.....Rochester
Smith, F. L.....Rochester
Smith, H. L.....Rochester
Smith, N. D.....Rochester
Snell, A. M.....Rochester
Spooner, A. D.....Rochester
Sprague, P. H.....Rochester
Stacy, L. J.....Rochester
Stafne, W. A.....Rochester
Stark, W. B.....Rochester
Starkey, T. A.....Rochester
Stephenson, G. W.....Rochester
Steven, George.....Byron
Steward, J. A.....Rochester
Stuck, W. G.....Rochester
Stuhler, L. G.....Rochester
Sutherland, C. G.....Rochester
Sutton, L. F.....Mazeppa
Swart, H. A.....Rochester
Thiessen, N. W.....Rochester
Thompson, G. J.....Rochester
Thornton, H. C.....Rochester
Thorsness, E. T.....Rochester
Tovell, R. M.....Rochester
Tyvand, R. E.....Rochester
Vanzant, Frances R.....Rochester
Vinson, P. P.....Rochester
Voldeng, K. E.....Rochester
Voris, H. C.....Rochester
Wagener, H. P.....Rochester
Wakefield, E. G.....Rochester
Waldron, G. W.....Rochester
Walker, M. A.....Rochester
Waller, L. M.....Rochester
Walters, Waltman.....Rochester
Watkins, C. H.....Rochester
Watson, J. R.....Rochester
Weber, H. M.....Rochester
Webster, W. W.....Rochester
Weir, J. F.....Rochester
Wellbrock, W. L. A.....Rochester
Welsh, A. L.....Rochester
Wilbur, D. L.....Rochester
Wilder, R. M.....Rochester
Wilkinsen, E. A.....Rochester
Williams, H. L., Jr.....Rochester
Willius, F. A.....Rochester
Wilson, L. B.....Rochester
Wolff, H. J.....Rochester
Woltman, H. W.....Rochester
Wood, H. G.....Rochester
Zinn, Charles J.....Rochester

PARK REGION DISTRICT AND COUNTY MEDICAL SOCIETY

Otter Tail, Wilkin, Grant and Douglas Counties
Regular meetings, second Wednesday in January, April, July, October
Annual meeting, second Wednesday in October

President

Kemp, M. W.....Fergus Falls

Secretary

Heiberg, E. A.....Fergus Falls

Baker, A. C.....Fergus Falls
Baker, N. H.....Fergus Falls
Benepe, J. L.....Dent
Boysen, Peter.....Pelican Rapids
Brabec, F. J.....Perham
Brabec, P. F.....Perham
Broker, W. S.....Battle Lake
Burnap, W. L.....Fergus Falls
Combacker, L. C.....Fergus Falls
Drought, W. W.....Fergus Falls
Esser, John.....Perham
Estrem, C. O.....Fergus Falls
Freeborn, J. A.....Fergus Falls
Halpern, D. J.....Battle Lake
Hand, W. R.....Elbow Lake
Haskell, A. D.....Alexandria
Heiberg, E. A.....Fergus Falls
Houkom, Bjarne.....Fergus Falls
Johnson, O. V.....Fergus Falls
Kemp, M. W.....Fergus Falls
Kierland, P. E.....Alexandria
Kittelson, T. N.....Fergus Falls
Lee, W. A.....Fergus Falls
Leibold, H. H.....Parkers Prairie
Lewis, A. J.....Henning
Love, F. A.....Carlos
Naegeli, Frank.....Fergus Falls
Nelson, O. N.....Battle Lake
Nelson, W. I.....Underwood
Otto, H. C.....Frazee
Parson, L. R.....Elbow Lake
Patterson, W. L.....Fergus Falls
Paulson, T. S.....Fergus Falls
Platt, F. B.....Battle Lake
Randall, A. M.....Ashby
Rimer, E. W.....Breckenridge
Satersmoen, Theo.....Pelican Rapids
Serkland, J. C.....Rothsay
Tanquist, E. J.....Alexandria
Vail, J. B.....Henning
Ylvisaker, R. S.....Fergus Falls

RAMSEY COUNTY MEDICAL SOCIETY

Regular meetings, last Monday of every month except June, July and August
Annual meeting, last Monday in January

President

Goltz, E. V.....St. Paul

Secretary

Schulze, A. G.....St. Paul

Ahrens, A. E.....St. Paul
Ahrens, A. H.....St. Paul
Alberts, Max W.....St. Paul
Alden, J. F.....St. Paul
Aldes, Harry.....St. Paul
Alexander, F. H.....St. Paul
Allen, Mason.....St. Paul
Arends, A. L.....Askov
Armstrong, J. M.....St. Paul
Arnquist, A. S.....St. Paul
Aurelius, J. Richards.....St. Paul
Backus, Andrew S.....St. Paul
Bacon, Donald K.....St. Paul
Bacon, Knox.....St. Paul
Bacon, L. C.....St. Paul
Balcome, F. E.....St. Paul
Barry, L. W.....St. Paul
Barsness, Nellie.....St. Paul
Beadie, W. D.....Cannon Falls
Beals, Hugh.....St. Paul
Bell, C. C.....St. Paul
Bennion, P. H.....St. Paul
Bentley, Norman P.....St. Paul
Berrisford, Paul D.....St. Paul
Bicek, Joseph F.....St. Paul
Binger, H. E.....St. Paul
Birnberg, T. L.....St. Paul
Bock, R. A.....St. Paul
Boeckmann, Egil.....St. Paul
Bohland, E. H.....St. Paul
Bole, R. S.....St. Paul
Borg, Joseph F.....St. Paul
Bouma, L. R.....St. Paul
Brand, G. D.....St. Paul
Bray, E. R.....St. Paul
Brimhall, J. B.*.....St. Paul
Brodie, Walter D.....St. Paul
Brooks, G. F.....St. Paul
Brown, Ed. I.....St. Paul
Brown, John C.....St. Paul
Burch, F. E.....St. Paul
Burfiend, G. H.....St. Paul
Burns, F. W.....St. Paul
Burns, R. M.....St. Paul
Burton, Carl G.....St. Paul
Busher, H.....St. Paul
Caldwell, Jas. P.....St. Paul
Caldwell, Kenneth S.....St. Paul
Cameron, J. A.....St. Paul
Campbell, J. E.....South St. Paul
Carroll, Wm. C.....St. Paul
Carter, Fred G.....St. Paul
Chatterton, C. C.....St. Paul
Christiansen, A.....St. Paul
Christison, J. T.....St. Paul
Clark, T. C.....Minneapolis
Cobb, S. G.....St. Paul
Colby, Woodard.....St. Paul
Cole, Wallace H.....St. Paul
Collie, H. G.....St. Paul
Colvin, A. R.....St. Paul
Conner, Wm. H.....Minneapolis
Connor, C. E.....St. Paul
Cottam, Gilbert G.....Minneapolis
Countryman, Roger S.....St. Paul
Cowern, E. W.....North St. Paul
Critchfield, L. R.....St. Paul
Crump, J. W.....St. Paul
Culligan, J. M.....St. Paul
Culligan, Leo C.....Mendota
Dack, Lloyd G.....St. Paul
Darling, J. B.....St. Paul
Daugherty, E. B.....St. Paul
Daugherty, L. E.....St. Paul
Davis, Herbert.....St. Paul
Davis, William.....St. Paul
Dedolph, Karl.....St. Paul
Derauf, B. I.....St. Paul
Dickson, Thos. H., Jr.....St. Paul
Dittman, Geo. C.....St. Paul
Dohm, A. J.....St. Paul
Donohue, P. F.....St. Paul
Dovre, C. M.....St. Paul
Drake, Carl B.....St. Paul
Dunn, J. N.....St. Paul
Dunne, Gerald P.....St. Paul
Earl, George A.....St. Paul
Earl, Robert O.....St. Paul
Edlund, G.....St. Paul
Ely, O. S.....South St. Paul
Emerson, E. C.....St. Paul
Endress, E. K.....St. Paul
Engberg, E. J.....St. Paul
Ernest, G. C.....St. Paul
Eshelby, E. C.....St. Paul
Fahey, E. W.....St. Paul
Ferguson, J. C.....St. Paul
Fesler, Harold H.....St. Paul
Fogarty, Chas. W.....St. Paul
Foley, F. E. B.....St. Paul
Freeman, C. D.....St. Paul
Fulton, John F.*.....St. Paul
Gager, E. C.....St. Paul
Garbrecht, Arthur.....St. Paul
Gardiner, D. G.....St. Paul
Gardner, Walter P.....St. Paul
Geer, Everett K.....St. Paul
Gehlen, J. N.....St. Paul
Geist, George A.....St. Paul
Ghent, C. Harry.....St. Paul
Ghent, M. M.....St. Paul
Gibbs, Edward C.....St. Paul
Gilfillan, J. S.....St. Paul
Ginsberg, Wm.....St. Paul
Goltz, E. V.....St. Paul
Grant, H. W.....St. Paul
Gratzek, Thos.....St. Paul
Gruenhagen, Arnold P.....St. Paul
Hagaman, Geo. K.....St. Paul
Hall, A. R.....St. Paul
Hall, Henry H.....St. Paul
Hammes, E. M.....St. Paul
Hammond, J. F.....St. Paul
Harmon, G. E.....St. Paul
Hartfiel, Wm. F.....St. Paul
Hartley, E. C., Jr.....St. Paul
Hauser, V. P.....St. Paul
Hawkins, V. J.....St. Paul
Heath, A. C.....St. Paul
Heck, Wm. W.....St. Paul
Hedenstrom, F. G.....St. Paul
Hengstler, W. H.....St. Paul
Hensel, C. N.....St. Paul
Herrmann, Edgar T.....St. Paul
Hesselgrave, S. S.....St. Paul
Hilger, A. W.....St. Paul
Hilger, D. D.....St. Paul
Hilger, L. A.....St. Paul
Hiniker, Louis P.....St. Paul
Hochfilzer, J. J.....St. Paul
Hoff, Alfred.....St. Paul
Hoffman, Max H.....St. Paul
Holcomb, J. T.....St. Paul
Holcomb, O. W.....St. Paul
Holt, John E.....St. Paul
Howard, W. S.....St. Paul
Hullsiek, Richard B.....St. Paul
Hultkrans, Joel C.....St. Paul
Hunt, H. E.....St. Paul

*Deceased.

Ide, A. W.....St. Paul
Ikeda, Kano.....St. Paul
Johnson, Asa M.....St. Paul
Johnson, C. E.....St. Paul
Johnson, Hartland C.....St. Paul
Johnson, J. Arthur.....St. Paul
Johnson, Ray G.....St. Paul
Johnson, T. H.....St. Paul
Jones, D. C.....St. Paul
Jones, E. M.....St. Paul
Kadesky, David.....St. Paul
Kamman, Gordon R.....St. Paul
Kamary, E. L.....St. Paul
Kelly, John V.....St. Paul
Kelly, Paul H.....St. Paul
Kenefick, E. V.....St. Paul
Kennedy, W. A.....St. Paul
Kenny, H. F.....St. Paul
Kesting, Herman.....St. Paul
King, George L.....St. Paul
King, Z. P.....St. Paul
Kistler, A. S.....St. Paul
Klein, H. N.....St. Paul
Knauff, M. K.....St. Paul
Kvitrud, G.....St. Paul
Langenderfer, F. V.....St. Paul
Larsen, C. L.....St. Paul
Lax, Morris H.....St. Paul
Leahy, Bartholomew.....St. Paul
Leavenworth, R. O.....St. Paul
Leitch, Archibald.....St. Paul
Leonard, Gilbert J.....St. Paul
Lepak, John A.....St. Paul
Lerche, William.....Cable, Wisconsin
Levin, Bert.....St. Paul
Lewis, W. W.....St. Paul
Lick, C. Louis.....St. Paul
Little, W. J.....St. Paul
Lowe, Earl R.....South St. Paul
Lowe, Thomas A.....South St. Paul
Lundholm, A. M.....St. Paul
McBeath, Ewing C.....New York City
McCarthy, W. R.....St. Paul
McClanahan, J. H.....White Bear
McClanahan, T. S.....White Bear
McCloud, C. N.....St. Paul
McKeon, Owen.....St. Paul
McLaren, Jennette M.....St. Paul
McNevin, C. F.....St. Paul
Madden, John F.....St. Paul
Martineau, J. L.....St. Paul
Mattson, Carl H.....St. Paul
Meyerding, E. A.....St. Paul
Moga, John A.....St. Paul
Mogilner, S. N.....St. Paul
Molander, H. A.....St. Paul
Moquin, Marie A.....St. Paul
Moran, T. R.....St. Paul
Morrissey, F. B.....St. Paul
Mortenson, N. G.....St. Paul
Moss, Myer N.....St. Paul
Moynihan, T. J.....St. Paul
Muller, R. Theo.....St. Paul
Myers, Thos.....St. Paul
Naegeli, A. E.....St. Paul
Neher, F. H.....St. Paul
Nelson, L. A.....St. Paul
Nippert, H. T.....St. Paul
Noble, John F.....St. Paul
Nordin, C. G.....St. Paul
Norris, Edgar H.....St. Paul
Nye, Katherine A.....St. Paul
Nye, Lillian L.....St. Paul
O'Brien, H. J.*.....St. Paul
O'Connor, L. J.....St. Paul
Oerting, Harry.....St. Paul
Ogden, Warner.....St. Paul
Ohage, Justus, Jr.....St. Paul
Ohage, Justus.....St. Paul
Olson, Chas. A.....St. Paul
O'Reilley, B. E.....St. Paul
Ostergren, E. W.....St. Paul
Page, C. V.....St. Paul
Pearson, F. R.....St. Paul
Pedersen, A. H.....St. Paul
Perry, C. G.....St. Paul
Peterson, V. N.....St. Paul
Plondke, F. J.....St. Paul
Prendergast, H. J.....St. Paul
Ramsey, W. R.....St. Paul
Richards, E. T. F.....St. Paul
Richardson, Harold E.....St. Paul
Ritchie, H. P.....St. Paul
Rogers, John T.....St. Paul
Rosenberger, Henry P.....St. Paul
Rosenholtz, Burton.....St. Paul
Rosenthal, Robert.....St. Paul
Rothrock, J. L.....St. Paul
Rothschild, H. J.....St. Paul
Roy, Philemon.....St. Paul
Ruhberg, George N.....St. Paul
Rutherford, W. C.....St. Paul
Ryan, John J.....St. Paul
Ryan, Mark E.....St. Paul
Satterlund, Victor.....St. Paul
Savage, F. J.....St. Paul
Schoch, R. B.....St. Paul
Schons, E.....St. Paul
Schuldt, F. C.....St. Paul
Schulze, Albert G.....St. Paul
Schwyzer, Arnold.....St. Paul
Senkler, G. E.....St. Paul
Setzer, H. J.....St. Paul
Shannon, W. Ray.....St. Paul
Shellman, John L.....St. Paul
Shillington, M. A.....St. Paul
Short, Jacob.....St. Paul
Simon, B. F.....St. Paul
Singer, Benj. J.....St. Paul
Skinner, H. O.....St. Paul
Snyder, G. W.....St. Paul
Sohlberg, O. I.....St. Paul
Souster, B. B.....St. Paul
Sprafka, J. M.....St. Paul
Steinberg, C. L.....St. Paul
Sterner, E. G.....St. Paul
Sterner, O. W.....St. Paul
Stevens, F. A.....Lake Elmo
Stewart, Alexander.....St. Paul
Stierle, Adolph.....St. Paul
Stinnette, S. E.....St. Paul
Stolpestad, H. L.....St. Paul
Swanson, Edwin O.....St. Paul
Swanson, John A.....St. Paul
Swendson, J. J.....St. Paul
Taylor, H. Longstreet*.....St. Paul
Teisberg, C. B.....St. Paul
Tregilgas, H. R.....South St. Paul
Van Slyke, Chas. A.....St. Paul
Veirs, Dean.....St. Paul
Veirs, Ruby Smith.....St. Paul
Von der Weyer, Wm.....St. Paul
Waas, C. W.....St. Paul
Warnock, R. W.....St. Paul
Warren, E. L.....St. Paul
Webber, Fred L.....St. Paul
Welch, M. C.....St. Paul
Werner, O. S.....Cambridge
Wheeler, M. W.....St. Paul
Whitacre, J. C.....St. Paul
Whitcomb, Ed. H.....St. Paul
White, J. S.....St. Paul
Whitmore, Frank.....St. Paul
Williams, Clayton.....St. Paul
Williamson, George A.....St. Paul
Winnick, J. B.....St. Paul
Wold, K. C.....St. Paul
Zimmermann, H. B.....St. Paul

RED RIVER VALLEY MEDICAL SOCIETY

Kittson, Marshall, Polk, Pennington, Red Lake, Roseau, Norman and Mahnomen Counties

Regular meetings, second Tuesday in April, September and December
Annual meeting, December

President
Mellby, O. F.....Thief River Falls

Secretary
Oppegaard, C. L.....Crookston

Adkins, C. M.....Grygla
Anderson, W. S.....Minneapolis
Bernard, B. C.....Thief River Falls
Bertelson, O. L.....Crookston
Biedermann, Jacob.....Thief River Falls
Blegen, H. M.....Warren
Bowers, J. T.....Thief River Falls
Bratrud, O. Edward.....Thief River Falls
Brown, Lyle L.....Crookston
Button, A. J.....Greenbush
Delmore, J. L.....Roseau
Dunlop, A. H.....Crookston
Engstrand, O. J.....Warren
Froehlich, H. W.....Minneapolis
Henney, W. H.....McIntosh
Hodgson, H. H.....Crookston
Hollands, W. H.....Fisher
Holmstrom, C. H.....Warren
Holte, Halvor.....Crookston
Kahala, Arthur.....Crookston
Kirk, G. P.....East Grand Forks
Leitch, N. M.....Warren
Locken, O. E.....Crookston
Lynde, Orrin G.....Thief River Falls
Mellby, O. F.....Thief River Falls
Mercil, William F.....Crookston
Morley, G. A.....Crookston
Nelson, H. E.....Crookston
Norman, J. F.....Crookston
Ohnstad, J. L.....McIntosh
Oppegaard, C. L.....Crookston
Oppegaard, M. O.....Crookston
Overend, K. V.....Hallock
Paradis, W. G.....Crookston
Parsons, J. G.....Crookston
Roy, J. A.....Red Lake Falls
Sather, Allen.....Fosston
Shaleen, A. W.....Hallock
Sheidlov, A.....Fosston
Sheiland, J. T.....Ada
Smith, Archie M.....Thief River Falls
Stuurmanns, S. H.....Erskine
Swedenburg, A. W.....Thief River Falls
Turnbull, Robert.....Fosston
Watson, N. M.....Red Lake Falls
Wattam, G. S.....Warren
Wiltrout, I. G.....Oslo

REDWOOD-BROWN COUNTY MEDICAL SOCIETY

Regular meetings, at call of President
Annual meeting, May

President
Dubbe, F. H.....New Ulm

Secretary
Meierding, W. A.....New Ulm

Abraham, Arden L.....Gibbon
Dubbe, F. H.....New Ulm
Dysterheft, Adolph F.....Gaylord
Fritsche, Albert.....New Ulm
Fritsche, Carl J.....New Ulm
Fritsche, L. A.*.....New Ulm
Gibbons, Francis C.....Comfrey
Goblirsch, A. P.....Sleepy Eye
Graham, W. D.....Hanska
Hammermeister, T. F.....New Ulm
Hovde, Rolf.....Winthrop
Jamieson, Earl.....Walnut Grove
Johnson, W. E.....Morgan
Kolset, C. D.....Sanborn
Kusske, A. L.....New Ulm
Lindahl, Merlyn J.....Winthrop
McLane, Evelyn G.....Sleepy Eye
McLane, W. O.....Sleepy Eye
Meierding, W. A.....New Ulm
Nuessle, Walter G.....Springfield
Peterson, R. A.....Vesta
Reineke, G. F.....New Ulm
Rothenburg, J. C.....Springfield
Saffert, C. A.....New Ulm
Schoch, J. L.....New Ulm
Seifert, Otto J.....New Ulm
Shrader, J. S.....Springfield
Vogel, J. H.....New Ulm
Weiser, G. B.....New Ulm
Wellcome, J. W. B.....Sleepy Eye
Wieckman, F. H.....Sleepy Eye
Wohlrabe, Clarence.....Springfield
Wohlrabe, E. J.....Springfield

*Deceased.

RICE COUNTY MEDICAL SOCIETY

Annual meeting, December

President
Murdoch, J. M. ..... Faribault

Secretary
Plonske, C. J. ..... Faribault

Babcock, F. M. ..... Northfield
Backe, Edmund ..... Kenyon
Beede, Ethel R. ..... Faribault
Davis, F. U. ..... Faribault
Dugan, Lawrence F. ..... Faribault
Dungay, Neil S. ..... Northfield
Engstrom, F. A. ..... Wanamingo
Francis, David W. ..... Faribault
Haessly, S. B. ..... Faribault
Hanson, A. M. ..... Faribault
Haynes, A. L. ..... Faribault
Huxley, F. R. ..... Faribault
Kanne, C. W. ..... Faribault
Kuske, A. W. ..... Faribault
Lane, Laura A. ..... Northfield
Lende, Norman ..... Faribault
Lexa, F. J. ..... Lonsdale
McBroom, D. E. ..... Cambridge
Mayland, M. L. ..... Faribault
Meyer, P. F. ..... Faribault
Moses, Joseph ..... Northfield
Murdoch, J. M. ..... Faribault
Nickerson, W. S. ..... Faribault
Plonske, C. J. ..... Faribault
Robilliard, C. M. ..... Faribault
Robilliard, W. F.* ..... Faribault
Rudie, C. N. ..... Kenyon
Rumpf, C. W. ..... Faribault
Rumpf, W. H. ..... Faribault
Seeley, I. F. ..... Northfield
Smith, P. A. ..... Faribault
Stewart, Gwendolyn ..... Faribault
Stiles, Angie G. ..... Northfield
Thorson, Orin P. ..... Northfield
Traeger, C. A. ..... Faribault
Warren, F. S. ..... Faribault
Wilson, Warren ..... Northfield
Wilson, W. E. ..... Northfield

ST. LOUIS COUNTY MEDICAL SOCIETY

St. Louis, Lake, Cook, Carlton and Itasca Counties
Regular meetings, second Thursday each month except July
Annual meeting, second Thursday, October

President
Gillespie, N. H. ..... Duluth

Secretary
Fischer, M. McC. ..... Duluth

Abbott, Wm. P. ..... Duluth
Adams, B. S. ..... Hibbing
Alexander, C. E. ..... Duluth
Arminen, K. V. ..... Duluth
Armstrong, E. L. ..... Duluth
Athens, A. G. ..... Duluth
Ayres, G. T. ..... Ely
Bagley, W. R. ..... Duluth
Bardon, Richard ..... Duluth
Barney, L. A. ..... Duluth
Berdez, G. L. ..... Duluth
Bergquist, K. E. ..... Duluth
Bianco, A. J. ..... Duluth
Binet, H. E. ..... Grand Rapids
Birkland, O. N. ..... Hibbing
Blacklock, S. S. ..... Hibbing
Blakely, C. C. ..... Barnum
Boman, P. G. ..... Duluth
Bowen, Robert L. ..... Hibbing
Boyer, S. H. ..... Duluth
Braden, A. J.* ..... Duluth
Braverman, N. J. ..... Duluth
Bray, C. W. ..... Biwabik
Buckley, R. P. ..... Coleraine
Bullen, F. W. ..... Hibbing
Burns, R. L. ..... Two Harbors
Cantwell, W. F. ..... International Falls
Carstens, C. F. ..... Hibbing
Chapman, T. L. ..... Duluth
Cheney, E. L. ..... Duluth
Christensen, E. P. ..... Two Harbors
Clark, F. F. ..... Duluth
Clement, Gage ..... Duluth
Collins, A. N. ..... Duluth
Collins, H. C. ..... Duluth
Coventry, W. A. ..... Duluth
Cummings, Damon W. ..... Hibbing
Dahlin, I. T. ..... Aurora
Davis, B. F. ..... Duluth
Doolittle, L. E. ..... Duluth
Doyle, G. C. ..... Duluth
Drenning, F. C. ..... Duluth
Eckman, P. F. ..... Duluth
Ekblad, J. W. ..... Duluth
Eklund, W. J. ..... Duluth
Elias, F. J. ..... Duluth
Emanuel, Karl W. ..... Duluth
Eppard, R. M. ..... Cloquet
Estrem, T. A. ..... Hibbing
Fawcett, K. R. ..... Duluth
Fellows, Manley F. ..... Duluth
Ferreira, G. J. ..... Duluth
Fischer, M. McC. ..... Duluth
Forbes, R. S. ..... Duluth
Gillespie, M. G. ..... Duluth
Gillespie, N. H. ..... Duluth
Goodman, C. E. ..... Virginia
Gowan, L. R. ..... Duluth
Graham, David ..... Duluth
Graham, R. D. ..... Duluth
Graham, Robert ..... Duluth
Graves, W. N. ..... Duluth
Haney, C. L. ..... Duluth
Harris, C. N. ..... Nashwauk
Hatch, W. E. ..... Duluth
Hathaway, S. J. ..... Proctor
Hayes, M. F. ..... Nashwauk
Haynes, M. H. ..... Menahga
Hedberg, G. A. ..... Nopeming
Heimark, O. E. ..... Duluth
Hill, F. E. ..... Duluth
Hirschboeck, F. J. ..... Duluth
Hirschfield, M. S. ..... Duluth
Holderman, J. W. ..... Duluth
Huseby, H. W. ..... Floodwood
Jacobson, Clarence ..... Chisholm
Jensen, T. J. ..... Duluth
Keyes, C. R. ..... Duluth
King, W. S. ..... Eveleth
Kiesling, I. H. ..... Nashwauk
Klein, Harry ..... Duluth
Kliman, F. E. ..... Duluth
Knapp, F. N. ..... Duluth
Kohlbry, C. O. ..... Duluth
Kotchevar, F. R. ..... Eveleth
Kraft, Peter ..... Duluth
Krantz, C. I. ..... Duluth
Kuth, J. R. ..... Duluth
Laird, A. T. ..... Nopeming
Lamont, John G. ..... Nopeming
Leckband, Norbert ..... Buhl
Lenont, C. B. ..... Virginia
Lepak, F. J. ..... Duluth
Litman, S. N. ..... Duluth
Loofbourrow, E. H. ..... Keewatin
Lum, C. E. ..... Duluth
McCarty, P. D. ..... Ely
McComb, C. F. ..... Duluth
McCoy, Mary K. ..... Duluth
McDaniel, S. P. ..... Mountain Iron
McDonald, A. L. ..... Duluth
McGiffert, E. N.* ..... Duluth
McHaffie, O. L. ..... Duluth
McLeod, James L. ..... Bovey
McNutt, John R. ..... Duluth
Macfarlane, P. H. ..... Chisholm
MacRae, G. C. ..... Duluth
Magie, W. H. ..... Duluth
Magney, F. H. ..... Duluth
Manley, J. R. ..... Duluth
Marsh, H. L. ..... Eveleth
Martin, E. T. ..... Duluth
Martin, W. C. ..... Duluth
Mayne, R. M. ..... Duluth
Merriman, L. L. ..... Duluth
Miners, G. A. ..... Deer River
Moe, Russell J. ..... Duluth
Moe, Thomas ..... Moose Lake
Monroe, P. B. ..... Two Harbors
Mooney, L. P. ..... Marble
More, C. W. ..... Eveleth
Morsman, L. W. ..... Hibbing
Morss, C. R. ..... Zumbrota
Murray, D. D.* ..... Duluth
Murray, R. A. ..... Duluth
Nelson, E. H. ..... Chisholm
Nelson, R. L. ..... Duluth
Nicholson, M. A. ..... Duluth
Nutting, R. E. ..... Duluth
Olson, A. E. ..... Duluth
Oredson, O. A. ..... Duluth
Parker, O. W. ..... Ely
Pennie, D. F. ..... Duluth
Power, J. E. ..... Duluth
Raadquist, C. S. ..... Hibbing
Raihala, John ..... Virginia
Raiter, F. W. S. ..... Cloquet
Raiter, R. F. ..... Cloquet
Robinson, J. M. ..... Duluth
Rood, D. C. ..... Duluth
Rowe, O. W. ..... Duluth
Rowles, E. K. ..... Coleraine
Rudie, P. S. ..... Duluth
Ryan, W. J. ..... Duluth
Saarf, O. E. ..... Baudette
Samson, E. R. ..... Chisholm
Scherer, C. A. ..... Duluth
Schroder, C. H. ..... Duluth
Seashore, D. E. ..... Duluth
Shapiro, E. Z. ..... Duluth
Shaw, A. W. ..... Buhl
Sinamark, Andrew ..... Hibbing
Sisler, C. E. ..... Grand Rapids
Slyfield, F. F. ..... Duluth
Smith, C. M. ..... Duluth
Smith, E. K. ..... Duluth
Smith, W. R. ..... Grand Marais
Spicer, F. W. ..... Duluth
St. Clair, G. G. ..... Duluth
Strathern, M. L. ..... Gilbert
Strobel, W. G. ..... Duluth
Sukeforth, L. A. ..... Duluth
Sutherland, H. N. ..... Ely
Swenson, A. O. ..... Duluth
Taylor, C. W. ..... Duluth
Tibbetts, M. H. ..... Duluth
Tilderquist, D. L. ..... Duluth
Tuohy, E. L. ..... Duluth
Urberg, S. E. ..... Duluth
Vercellini, C. E. ..... Duluth
Webber, E. E. ..... Duluth
West, E. J. ..... Duluth
Wheeler, D. W. ..... Duluth
Wilkinson, Stella ..... Duluth
Winter, J. A. ..... Duluth
Young, T. O. ..... Duluth
Young, V. A. ..... Duluth

SCOTT-CARVER COUNTY MEDICAL SOCIETY

Regular meetings, second Tuesday of each month
Annual meeting, second Tuesday in June

President
Emmerson, W. S. ..... Mayer

Secretary
Cervenka, C. F. ..... New Prague

Bohland, F. J. ..... Belle Plaine
Buck, Fred H. ..... Shakopee
Cervenka, Charles F. ..... New Prague
Eklund, E. J. ..... Norwood
Emmerson, W. S. ..... Mayer
Fischer, H. P. ..... Shakopee
Fischer, P. M. ..... Shakopee
Halgren, Harry A. ..... Watertown
Hebeisen, M. B. ..... Carver
Juergens, H. M. ..... Belle Plaine
Kolars, J. J. ..... Le Center
McKeon, James ..... St. Paul
Maertz, W. F. ..... New Prague
Martin, T. P. ..... Arlington
Nagel, H. D. ..... Waconia
Novak, E. E. ..... New Prague
Olson, Chester J. ..... Belle Plaine
Ormond, Douglas ..... Waconia
Phillips, W. H. ..... Jordan
Reiter, H. W. ..... Shakopee
Schimelpfenig, Geo. T. ..... Chaska
Schneider, H. A. ..... Jordan
Simons, B. H. ..... Chaska
Westerman, A. E. ..... Montgomery
Westerman, F. C. ..... Montgomery
Woodworth, L. F. ..... Le Center
Wunder, Henry E. ..... Shakopee

*Deceased.

SOUTHWESTERN MINNESOTA MEDICAL SOCIETY

Pipestone, Rock, Murray, Nobles, Cottonwood and Jackson Counties

Annual meeting, October

President
Slater, S. A.....Worthington

Secretary
McKeown, E. G.....Pipestone

Arnold, E. W.....Adrian
Basinger, H. P.....Windom
Basinger, H. R.....Mountain Lake
Benjamin, W. G.....Pipestone
Bofenkamp, F. W.....Luverne
Bong, J. H.....Jasper
Brown, A. H.....Pipestone
Chadbourn, A. G.....Heron Lake
Clark, C. H.....Ruthton
Clark, H. H.....Edgerton
Cress, P. J.....Ellsworth
De Boer, H.....Edgerton
Ditmeier, L. M. Gerber.....Jasper
Dolan, C. P.....Worthington
Doms, H. C.....Slayton
Engh, Sigfred.....Jackson
Halloran, Walter.....Jackson
Hitchings, W. S.....Lakefield
Kelling, Louis F.....Lakefield
Kendahl, A. M.....Jasper
Kilbride, E. A.....Worthington
Lowe, Thos.....Pipestone
McCrea, James.....Fulda
McKeown, E. G.....Pipestone
Manson, F. M.....Worthington
Mork, B. O.....Worthington
Nusbaum, D. H.....Jackson
Patterson, W. E.....Westbrook
Pertl, A. L.....Windom
Piper, Wm. A.....Mountain Lake
Portmann, W. C.....Jackson
Rose, J. T.....Lakefield
Ross, W. P.....Worthington
Schutz, Elmer S.....Mountain Lake
Sherman, C. L.....Luverne
Slater, S. A.....Worthington
Smallwood, J. T.....Worthington
Sogge, L.....Windom
Stanley, C. R.....Worthington
Stratte, H. C.....Windom
Taylor, Wm. J.....Pipestone
Thorson, E. O.....Luverne
Tofte, Josephine.....Dawson
Waller, J. D.....Wilmont
Watson, F. G.....Worthington
Watson, Sydney.....Worthington
Williams, A. B.....St. Paul
Williams, L. A.....Slayton
Wright, C. O.....Luverne

STEARNS-BENTON COUNTY MEDICAL SOCIETY

Regular meetings, monthly

Annual meeting, April

President
Friesleben, Wm.....Sauk Rapids

Beuning, J. B.....Albany
Boehm, J. C.*.....St. Cloud
Buscher, Julius C.....St. Cloud
Du Bois, J. A.....Sauk Center
Du Bois, J. F.....Sauk Center
Engstrom, Geo. F.....Belgrade
Freeman, W. L.....St. Cloud
Friesleben, Wm.....Sauk Rapids
Gelz, J. J.....St. Cloud
Goehrs, H. W.....St. Cloud
Haberman, E.....Osakis
Hemstead, Werner.....St. Cloud
Holdridge, Geo.....Foley
Johnson, Walfred.....Sauk Center
Jones, Richard N.....St. Cloud
Kohler, D. W.....St. Joseph
Koop, S. H.....Richmond
Kuhlmann, August.....Melrose
Lewis, C. B.....St. Cloud
Libert, John N.....St. Cloud
McDowell, J. P.....St. Cloud
Mahowald, A.....Albany
Meyer, A. A.....Melrose
Moynihan, A. F.....Sauk Center
Rathbun, A. M.....Rice
Rathbun, C. A.....St. Cloud
Richards, W. B.....St. Cloud
Ridgway, Alexander.....South Haven
Schatz, F. J.....St. Cloud
Sherwood, G. E.....Kimball
Stangl, Fred.....St. Cloud
Stickney, Charlotte A.....St. Cloud
Sutton, Chas. S.....St. Cloud
Sweetman, R. H.....Sauk Center
Wenner, W. T.....St. Cloud
Zachman, A. H.....Melrose

STEELE COUNTY MEDICAL SOCIETY

Annual meeting, second Tuesday in November

President
McIntyre, J. A.....Owatonna

Secretary
Dewey, D. H.....Owatonna

Dewey, Donald H.....Owatonna
Ertel, Edward Q.....Ellendale
Flores, O. T.....Dodge Center
Gault, C. C.*.....Owatonna
McIntyre, John A.....Owatonna
Melby, Benedik.....Blooming Prairie
Nelson, Ernest J.....Owatonna
Schaefer, Joseph F.....Owatonna
Senn, E. W.....Owatonna
Smersh, J. F.....Owatonna
Stewart, A. B.....Owatonna

UPPER MISSISSIPPI MEDICAL SOCIETY

Aitkin, Crow Wing, Morrison, Cass, Todd, Wadena, Clearwater, Koochiching, Hubbard and Beltrami Counties

Regular meetings, Spring, Summer, Fall

Annual meeting, January

President
McHugh, R. F.....Aitkin

Secretary
Van Valkenburg, F. W.....Long Prairie

Agnew, A. T.....International Falls
Allen, F. H.....Staples
Badeaux, G. I.....Brainerd
Beise, R. A.....Brainerd
Borreson, Baldwin.....Ah-Gwah-Ching
Borgerson, A. H.....Hewitt
Burns, H. A.....Ah-Gwa-Ching
Christie, G. R.....Long Prairie
Christie, R. L.....Long Prairie
Cook, J. M.....Staples
Corrigan, J. E.....Spooner
Craig, C. C.....International Falls
Davis, L. T.....Wadena
Davis, T. C.....Wadena
Frost, H. T.....Wadena
Garlock, A. V.....Bemidji
Garlock, D. H.....Bemidji
Gerber, M. P.....Brainerd
Grawn, F. A.....Northome
Grogan, J. S.....Wadena
Groschupf, T. P.....Bemidji
Grose, F. N.....Clarissa
Hanson, E. C.....Park Rapids
Hawkinson, J. P.....Crosby
Hawkinson, L. F.....Brainerd
Healy, R. T.....Pierz
Hendrickson, R. R.....Wadena
Holst, C. F.....Little Falls
Holst, J. B.....Little Falls
House, Z. E.....Cass Lake
Houston, C. A.....Park Rapids
Hubin, E. G.....Deerwood
Jamieson, E. F.....Brainerd
Johnson, E. W.....Bemidji
Kelly, B. W.....Aitkin
Kenyon, Paul.....Wadena
Kerlan, S. Z.....Aitkin
Larson, L. M.....Oak Terrace
Larson, Leroy J.....Bagley
Laughlin, J. T.....Grey Eagle
Lodmell, E. A.....Sebeka
McHugh, R. F.....Aitkin
Marcum, E. H.....Bemidji
Mark, Hilbert.....Ah-Gwah-Ching
Miller, W. A.....New York Mills
Moyer, R. E.....Bemidji
Nelson, Nesmith.....Brainerd
Osburn, B. F.....International Falls
Pierce, C. H.....Wadena
Ringle, O. F.....Walker
Roberts, L. M.....Little Falls
Rosenfield, A. B.....Pequot
Sach-Rowitz, Alvin.....McGregor
Shannon, S. S.....Crosby
Simons, E. J.....Swanville
Smith, B. A.....Crosby
Smith, E. H.....Bemidji
Thabes, J. A., Sr.....Brainerd
Van Valkenburg, B. F.....Long Prairie
Van Valkenburg, F. W.....Long Prairie
Watson, J. D.....Holdingford
Will, W. W.....Bertha
Withrow, M. E.....International Falls

*Deceased.

WABASHA COUNTY MEDICAL SOCIETY

Annual meeting, first Thursday after first Monday in July

President
Wilson, W. F.....Lake City

Secretary
Frost, R. H.....Wabasha

Bayley, E. C.....Lake City
Bowers, H. E.....Lake City
Cochrane, W. J.....Lake City
Collins, J. S.....Wabasha
Dempsey, D. P.....Kellogg
Fleischhauer, D. S.....Wabasha
Frost, R. H.....Wabasha
Radabaugh, R. C.....Hastings
Replogle, W. H.....Wabasha
Slocumb, J. A.....Plainview
Stryker, W. B.....Plainview
Wilson, W. F.....Lake City

WASECA COUNTY MEDICAL SOCIETY

Annual meeting, second Friday in December

President
Gallagher, B. J.....Waseca

Secretary
Tavenner, L. J.....Waseca

Bernstein, W. C.....New Richland
Gallagher, B. J.....Waseca
Hagen, H. O.....New Richland
McIntyre, H. M.....Waseca
O'Hara, J. J.*.....Janesville
Saliterman, B. I.....Janesville
Swenson, O. J.....Waseca
Tavenner, L. J.....Waseca

WASHINGTON COUNTY MEDICAL SOCIETY

Regular meetings, second Tuesday of month, except June, July and August
Annual meeting, second Tuesday in December

President
Strand, E. V.....Bayport

Secretary
Boleyn, E. S.....Stillwater
Boleyn, E. S.....Stillwater

Haines, J. H.....Stillwater
Hewson, Wilfred J.....Stillwater
Humphrey, W. R.....Stillwater
Josewski, R. J.....Stillwater
Kalinoff, D.....Stillwater
Petraborg, H. T.....Stillwater
Poirier, J. A.....Forest Lake
Sherman, C. H.....Bayport
Strand, E. V.....Bayport
Stuhr, J. W.....Stillwater
Thompson, V. C.....Marine-on-St. Croix
Van Meier, Henry.....Stillwater

WATONWAN COUNTY MEDICAL SOCIETY

Regular meetings, on call
Annual meeting, December

President
Bergman, O. B.....St. James

Secretary
Grimes, H. B.....Madelia

Bergman, O. B.....St. James
Bratrude, E. J.....St. James
Bregel, Fred L.....St. James
Grimes, H. B.....Madelia
Hagen, O. E.....Butterfield
McCarthy, W. J.....Madelia
Thompson, Albert.....St. James

WEST CENTRAL MINNESOTA MEDICAL SOCIETY

Big Stone, Traverse, Pope and Stevens Counties
Regular meetings, January, April, June and October
Annual meeting, first Wednesday in October

President
Doleman, N. F.....Tintah

Secretary
Lindberg, A. L.....Wheaton

Arneson, A. I.....Starbuck
Bergan, Otto.....Clinton
Bolsta, Chas.....Ortonville

Caine, C. E.....Morris
Christenson, C. R.....Minneapolis
Doleman, N. F.....Tintah
Eberlin, E. A.....Glenwood
Elsey, E. McC.....Glenwood
Elsey, J. R.....Glenwood
Ewing, C. F.....Wheaton
Fitzgerald, E. T.....Morris
Giesen, A. F.....Starbuck
Karn, B. R.....Ortonville
Leland, J. T.....Herman
Lindberg, A. L.....Wheaton
McIver, B. A.....Lowry
O'Donnell, D. M.....Ortonville
Oliver, C. I.....Graceville
Oliver, I. L.....Graceville
Pierson, Claude M.*.....Wheaton
Ransom, M. L.....Hancock
Shelver, H. J.....Ortonville

WINONA COUNTY MEDICAL SOCIETY

Regular meetings, first Monday in January, April, July and October
Annual meeting, first Monday in January

President
Mattison, P. A.....Winona

Secretary
Steiner, I. W.....Winona

Benoit, F. T.....Winona
Clay, F. H.....St. Charles
Dierkes, G. J.....Rollingstone
Fetter, Mary.....Winona

Heise, W. F. C.....Winona
Keyes, E. D.....Winona
Keyes, J. D.....Winona
Kreuzer, T. C.....Owatonna
Lichtenstein, H.....Winona
McDonnell, C. H.*.....Winona
McLaughlin, E. M.....Winona
Mattison, P. A.....Winona
Meinert, A. E.....Winona
Nauth, W. W.....Winona
Neumann, C. A.....Winona
Page, R. L.....St. Charles
Pritchard, D. B.*.....Winona
Risser, E. D.....Winona
Robbins, C. P.....Winona
Satterlee, H. W.....Lewiston
Schaefer, S.....Winona
Steiner, I. W.....Winona
Tweedy, G. J.....Winona
Walker, G. H.....Winona
Wilson, R. H.....Winona
Younger, L. I.....Winona

WRIGHT COUNTY MEDICAL SOCIETY

Regular meetings, quarterly
Annual meeting, second Tuesday in October

President
Ellison, F. E.....Monticello

Secretary
Catlin, J. J.....Buffalo

Bendix, L. H.....Annandale
Catlin, J. J.....Buffalo

Clark, H. E.....Howard Lake
Ellison, F. E.....Monticello
Freed, O. J. R.....Cokato
Harriman, L.....Howard Lake
Hart, W. E.....Monticello
Johnson, V. P.....Delano
Klaveness, E.....St. Paul
Lee, J. L.....Watertown
Norris, G. H.....Annandale
Olson, J. Wm.....Cokato
Peterson, O. L.....Cokato
Phillips, A. E.....Delano
Ridgway, A. M.....Annandale
Roholt, C. L.....Waverly
Rousseau, Victor.....Maple Lake
Swezey, B. F.....Buffalo

*Deceased.

ALPHABETICAL ROSTER

Name	Address
Aanes, A. M.	Red Wing
Abbott, Wm. P.	Duluth
Aborn, W. H.	Hawley
Abraham, A. L.	Gibbon
Adams, B. S.	Hibbing
Adams, R. C.	Bird Island
Adkins, C. M.	Grygla
Adson, A. W.	Rochester
Affeldt, D. E.	Kasson
Agnew, A. T.	International Falls
Ahrens, A. E.	St. Paul
Ahrens, A. H.	St. Paul
Aitkens, H. B.	Le Center
Alberts, M. W.	St. Paul
Alden, J. F.	St. Paul
Aldes, Harry	St. Paul
Alderson, L. R.	Rochester
Alexander, C. E.	Duluth
Alexander, F. H.	St. Paul
Alexander, H. A.	Minneapolis
Aling, C. P.	Minneapolis
Allan, F. N.	Rochester
Allen, A. W.	Austin
Allen, C. C.	Austin
Allen, E. V.	Rochester
Allen, F. H.	Staples
Allen, H. W.	Minneapolis
Allen, Mason	St. Paul
Allen, R. B.	Rochester
Allen, R. W.	Rochester
Allen, W. A.	Rochester
Allison, R. G.	Minneapolis
Almquist, H. E.	Minneapolis
Altnow, H. O.	Minneapolis
Alvarez, W. C.	Rochester
Amberg, Samuel	Rochester
Andersen, A. G.	Minneapolis
Andersen, S. C.	Minneapolis
Anderson, A. S.	St. Paul
Anderson, C. M.	Rochester
Anderson, D. D.	Minneapolis
Anderson, E. D.	Minneapolis
Anderson, E. R.	Minneapolis
Anderson, F. J.	Minneapolis
Anderson, J. K.	Minneapolis
Anderson, K. W.	Minneapolis
Anderson, M. J.	Rochester
Anderson, N. E.	Harmony
Anderson, P. A.	Minneapolis
Anderson, R. E.	Willmar
Anderson, S. H.	Red Wing
Anderson, W. S.	Minneapolis
Andreassen, E. C.	Minneapolis
Andrews, J. W.	Mankato
Andrews, R. N.	Mankato
Annis, H. B.	Minneapolis
Archibald, F. M.	Mahnomen
Arends, A. L.	Askov
Arey, H. C.	Excelsior
Arminen, K. V.	Duluth
Armstrong, E. L.	Duluth
Armstrong, J. M.	St. Paul
Arneson, A. I.	Starbuck
Arnquist, A. S.	St. Paul
Arnold, E. W.	Adrian
Arnson, J. M.	Benson
Arvidson, C. G.	Minneapolis
Athens, A. G.	Duluth
Atkinson, Walter	Rochester
Aune, Martin	Minneapolis
Aurand, W. H.	Minneapolis
Aurelius, J. R.	St. Paul
Avery, J. F.	Minneapolis
Ayres, G. T.	Ely
Babcock, F. M.	Northfield
Backe, E.	Kenyon
Backus, Andrew S.	St. Paul
Bacon, D. K.	St. Paul
Bacon, Knox	St. Paul
Bacon, L. C.	St. Paul
Bacon, R. S.	Montevideo
Badeaux, G. I.	Brainerd
Bagley, W. R.	Duluth
Bailey, H. B.	Fairmont
Baken, M. P.	Minneapolis
Baker, A. C.	Fergus Falls
Baker, A. T.	Minneapolis
Baker, E. L.	Minneapolis
Baker, Harry R.	Hayfield
Baker, Looe	Minneapolis
Baker, N. H.	Fergus Falls
Balcome, F. E.	St. Paul
Balfour, D. C.	Rochester
Ball, R. G.	Rochester
Bannick, E. G.	Rochester
Barber, J. P.	Minneapolis
Barber, K. W.	Rochester
Barborka, C. J.	Rochester
Bardon, Richard	Duluth
Bargen, J. A.	Rochester
Barker, N. W.	Rochester
Barnes, A. R.	Rochester
Barney, L. A.	Duluth
Barron, Moses	Minneapolis
Barry, L. W.	St. Paul
Barsness, Nellie	St. Paul
Bartels, E. C.	Rochester
Basinger, H. P.	Windom
Basinger, H. R.	Mountain Lake
Bass, G. W.	Minneapolis
Baxter, S. H.	Minneapolis
Bayard, H. F.	Minneapolis
Bayley, E. C.	Lake City
Beadie, W. D.	Cannon Falls
Beals, Hugh	St. Paul
Beard, A. H.	Minneapolis
Beard, R. O.	Minneapolis
Bedford, E. W.	Minneapolis
Beede, Ethel R.	Faribault
Behmler, F. W.	Appleton
Beise, R. A.	Brainerd
Beiswanger, R. H.	Wykoff
Bell, C. C.	St. Paul
Bell, E. T.	Minneapolis
Bell, J. W.	Minneapolis
Belote, G. B.	Caledonia
Benedict, E. E.	Minneapolis
Bendix, L. H.	Annandale
Benedict, W. L.	Rochester
Benepe, J. L.	Dent
Benham, E. W.	Mankato
Benjamin, A. E.	Minneapolis
Benjamin, W. G.	Pipestone
Benn, F. G.	Minneapolis
Bennett, R. J., Jr.	Rochester
Bennion, P. H.	St. Paul
Benoit, F. T.	Winona
Bentley, N. P.	St. Paul
Berdez, G. L.	Duluth
Bergan, Otto	Clinton
Berger, E. H.	Rochester
Bergh, L. N.	Montevideo
Bergheim, M. C.	Hawley
Bergman, O. B.	St. James
Bergquist, K. E.	Duluth
Berkman, D. M.	Rochester
Berkman, J. M.	Rochester
Berkwitz, N. J.	Minneapolis
Bernard, B. C.	Thief River Falls
Bernstein, W. C.	New Richland
Berrisford, P. D.	St. Paul
Bertelson, O. L.	Crookston
Bessesen, A. N., Sr.	Minneapolis
Bessesen, A. N., Jr.	Minneapolis
Bessesen, W. A.	Minneapolis
Beuning, J. B.	Albany
Bianco, A. J.	Duluth
Bicek, J. F.	St. Paul
Biedermann, Jacob	Thief River Falls
Billings, R. E.	Franklin
Binet, H. E.	Grand Rapids
Binger, H. E.	St. Paul
Binger, M. W.	Rochester
Birkland, O. N.	Hibbing
Birnberg, T. L.	St. Paul
Black, William	Mankato
Blacklock, S. S.	Hibbing
Blake, James	Hopkins
Blakely, C. C.	Barnum
Blanchard, H. G.	Fairmont
Blaustone, H. H.	Minneapolis
Blegen, H. M.	Warren
Blumenthal, Jacob	Minneapolis
Bock, R. A.	St. Paul
Bockman, M. W. H.	Minneapolis
Boeckmann, Egil	St. Paul
Boehm, J. C.*	St. Cloud
Bohland, E. H.	St. Paul
Bohland, F. J.	Belle Plaine
Boies, L. R.	Minneapolis
Bofenkamp, F. W.	Luverne
Bole, R. S.	St. Paul
Boleyn, E. S.	Stillwater
Bolsta, Chas.	Ortonville
Boman, P. G.	Duluth
Bong, J. H.	Jasper
Booth, A. E.	Minneapolis
Boothby, W. M.	Rochester
Boreen, C. A.	Minneapolis
Borg, J. F.	St. Paul
Borgeson, E. J.	Minneapolis
Borgerson, A. H.	Hewitt
Borreson, Baldwin	Ah-Gwah-Ching
Bossingham, O. N.	Lake Benton
Bottolfson, B. T.	Moorhead
Boudry, M. O.	Rochester
Bouma, L. R.	St. Paul
Bouman, H. A.	Minneapolis
Bowen, R. L.	Hibbing
Bowers, H. E.	Lake City
Bowert, J. T.	Thief River Falls
Bowing, H. H.	Rochester
Boyer, S. H.	Duluth
Boynton, Ruth	Minneapolis
Boysen, H.	Welcome
Boysen, Peter	Pelican Rapids
Braasch, W. F.	Rochester
Brabec, F. J.	Perham
Brabec, P. F.	Perham
Bracken, H. M.	Claremont, Calif.
Braden, A. J.*	Duluth
Brand, G. D.	St. Paul
Brand, W. A.	Redwood Falls
Branham, D. S.	Albert Lea
Branton, A. F.	Willmar
Branton, B. J.	Willmar
Bratrud, A. F.	Minneapolis
Bratrud, O. E.	Thief River Falls
Bratrude, E. J.	St. James
Brav, E. A.	Rochester
Braverman, N. J.	Duluth
Bray, C. W.	Biwabik
Bray, E. R.	St. Paul
Bregel, F. L.	St. James
Brekke, H. J.	Caledonia
Brigham, Frank	Watkins
Brimhall, J. B.*	St. Paul
Broders, A. C.	Rochester
Brodie, W. D.	St. Paul
Broker, W. S.	Battle Lake
Brooks, G. F.	St. Paul
Brown, A. E.	Rochester
Brown, A. H.	Pipestone
Brown, E. D.	Minneapolis
Brown, E. I.	St. Paul
Brown, Edw. J.	Minneapolis
Brown, G. E.	Rochester
Brown, J. C.	St. Paul
Brown, L. L.	Crookston
Brown, P. W.	Rochester
Brown, R. W.	Rochester
Brownstone, Manuel	Sandstone
Brunsting, L. A.	Rochester
Brusegard, J. F.	Red Wing
Bryant, O. R.	Minneapolis
Buck, F. H.	Shakopee
Buckley, R. P.	Coleraine
Buie, L. A.	Rochester
Bulkley, Kenneth	Minneapolis
Bullard, Mattie J.	Minneapolis
Bullen, F. W.	Hibbing
Bumpus, H. C.	Rochester
Burch, F. E.	St. Paul
Burfiend, G. H.	St. Paul
Burke, C. F.	Rochester
Burkley, G. G.	Rochester
Burnap, W. L.	Fergus Falls
Burns, F. W.	St. Paul
Burns, H. A.	Ah-Gwah-Ching
Burns, H. D.	Albert Lea
Burns, M. A.	Milan
Burns, R. L.	Two Harbors
Burns, R. M.	St. Paul
Burton, C. G.	St. Paul
Buscher, J. C.	St. Cloud
Busher, H.	St. Paul
Butler, John	Minneapolis
Button, A. J.	Greenbush
Butturff, C. R.	Freeborn
Butz, J. A.	Monterey
Butzer, J. A.	Mankato
Buzzelle, L. K.	Minneapolis
Cable, M. L.	Minneapolis
Cabot, C. M.	Rochester
Cabot, G. S.	Minneapolis
Cabot, Hugh	Rochester
Cabot, V. S.	Minneapolis
Cady, L. H.	Minneapolis
Cain, E. F.	Rochester
Caine, C. E.	Morris
Caldwell, K. S.	St. Paul
Caldwell, J. P.	St. Paul
Caldwell, J. M.	Rochester
Calhoun, F. W.	Albert Lea
Callahan, F. F.	Pokegama
Callerstrom, G. W.	Minneapolis
Cameron, Isabell	Minneapolis
Cameron, J. A.	St. Paul
Cameron, M. C., Jr.	Rochester
Camp, J. D.	Rochester
Camp, W. E.	Minneapolis
Campbell, J. E.	So. St. Paul
Campbell, L. M.	Minneapolis
Campbell, O. J.	Minneapolis

*Deceased.

Campbell, R. A. ..... Minneapolis
Canfield, W. W. ..... Houston
Cantwell, W. F. ..... International Falls
Cardle, A. E. ..... Minneapolis
Carey, J. B. ..... Minneapolis
Carlaw, C. M. ..... Minneapolis
Carlson, Lawrence ..... Minneapolis
Carman, J. E. ..... Detroit Lakes
Caron, R. P. ..... Minneapolis
Carroll, W. C. ..... St. Paul
Carstens, C. F. ..... Hibbing
Carter, F. G. ..... St. Paul
Castleton, K. B. ..... Rochester
Catlin, J. J. ..... Buffalo
Cavanor, F. T. ..... Minneapolis
Cervenka, C. F. ..... New Prague
Chadbourn, A. G. ..... Heron Lake
Chamberlain, H. E. ..... Minneapolis
Chambers, W. C. ..... Blue Earth
Chapman, C. B. ..... Rochester
Chapman, T. L. ..... Duluth
Chatterton, C. C. ..... St. Paul
Cheleen, S. J. ..... Minneapolis
Cheney, E. L. ..... Duluth
Cherry, C. H. ..... Minneapolis
Chesley, A. J. ..... Minneapolis
Christensen, E. E. ..... Rochester
Christensen, E. P. ..... Two Harbors
Christenson, C. R. ..... Minneapolis
Christianson, A. ..... St. Paul
Christianson, H. W. ..... Rochester
Christie, G. R. ..... Long Prairie
Christie, R. L. ..... Long Prairie
Christison, J. T. ..... St. Paul
Church, G. T. ..... Rochester
Cilley, E. I. L. ..... Rochester
Clark, C. H. ..... Ruthton
Clark, F. F. ..... Duluth
Clark, H. E. ..... Howard Lake
Clark, H. H. ..... Edgerton
Clark, H. S. ..... Minneapolis
Clark, T. C. ..... Minneapolis
Clay, F. H. ..... St. Charles
Claydon, D. R. ..... Red Wing
Claydon, L. E. ..... Red Wing
Clement, Gage ..... Duluth
Clement, J. B. ..... Lester Prairie
Cobb, S. G. ..... St. Paul
Cobb, W. F. ..... Lyle
Cochrane, W. J. ..... Lake City
Cohen, S. S. ..... Oak Terrace
Colby, Woodard ..... St. Paul
Cole, H. B. ..... Redwood Falls
Cole, W. H. ..... St. Paul
Coleman, F. B. ..... Austin
Collie, H. G. ..... St. Paul
Collins, A. N. ..... Duluth
Collins, D. C. ..... Rochester
Collins, H. C. ..... Duluth
Collins, J. S. ..... Wabasha
Colvin, A. R. ..... St. Paul
Combacker, L. C. ..... Fergus Falls
Comfort, M. W. ..... Rochester
Condit, W. H. ..... Minneapolis
Conner, H. M. ..... Rochester
Conner, W. H. ..... Minneapolis
Connor, C. E. ..... St. Paul
Cook, E. N. ..... Rochester
Cook, J. M. ..... Staples
Cook, H. W. ..... Minneapolis
Cooney, H. C. ..... Princeton
Cooper, M. D. ..... Winnebago
Cooperman, H. O. ..... Minneapolis
Corbett, J. F. ..... Minneapolis
Cornica, A. D. ..... Minneapolis
Corrigan, J. E. ..... Spooner
Cosgriff, J. A. ..... Olivia
Cosman, E. O. ..... Minneapolis
Costello, R. T. ..... Rochester
Cottam, Gilbert ..... Minneapolis
Counseller, V. S. ..... Rochester
Countryman, R. S. ..... St. Paul
Covell, W. W. ..... St. Peter
Coventry, W. A. ..... Duluth
Cowern, E. W. ..... North St. Paul
Cox, F. W. ..... Rochester
Craddock, W. H. ..... Rochester
Crafts, L. M. ..... Minneapolis
Craig, C. C. ..... International Falls
Craig, W. McK. ..... Rochester
Cranmer, R. R. ..... Minneapolis
Cranston, R. W. ..... St. Louis Park
Creighton, R. H. ..... Minneapolis
Cremer, M. H. ..... Red Wing
Crenshaw, J. L. ..... Rochester
Cress, E. E. ..... Boyd
Cress, P. J. ..... Ellsworth
Crewe, J. E. ..... Rochester
Crisp, N. W. ..... Rochester
Critchfield, L. R. ..... St. Paul
Cronwell, B. J. ..... Austin
Crump, J. W. ..... St. Paul
Culligan, J. M. ..... St. Paul

Culligan, L. C. ..... Mendota
Cummings, D. W. ..... Hibbing
Curry, F. S. ..... Rochester
Curtin, J. F. ..... Minneapolis
Cutts, George ..... Minneapolis
Cutts, R. E. ..... Rochester

Dack, L. G. ..... St. Paul
Dady, E. E. ..... Minneapolis
Dahl, E. O. ..... Minneapolis
Dahl, G. A. ..... Mankato
Dahl, J. A. ..... Minneapolis
Dahlin, I. T. ..... Aurora
Dahlstrom, A. W. ..... Minneapolis
Daignault, Oscar ..... Benson
Daniel, D. H. ..... Minneapolis
Daniel, L. M. ..... Minneapolis
Daniels, J. W. ..... St. Peter
Daniels, L. E. ..... Rochester
Danielson, K. A. ..... Litchfield
Darling, J. B. ..... St. Paul
Dart, L. O. ..... Minneapolis
Daugherty, E. B. ..... St. Paul
Daugherty, L. E. ..... St. Paul
Davis, A. C. ..... Rochester
Davis, B. F. ..... Duluth
Davis, F. U. ..... Faribault
Davis, Herbert ..... St. Paul
Davis, I. G. ..... Rushford
Davis, L. T. ..... Wadena
Davis, T. C. ..... Wadena
Davis, William ..... St. Paul
De Boer, Hermanus ..... Edgerton
De Carle, Donald W. ..... Rochester
Decker, F. H. ..... Rochester
Dedolph, Karl ..... St. Paul
Delmore, J. L. ..... Roseau
Dempsey, D. P. ..... Kellogg
Denman, A. V. ..... Mankato
Derauf, B. I. ..... St. Paul
Desjardins, A. U. ..... Rochester
Devereaux, T. J. ..... Wayzata
Dewar, J. E. ..... Minneapolis
Dewey, D. H. ..... Owatonna
Deziel, G. ..... Minneapolis
Dickson, T. H., Jr. ..... St. Paul
Diehl, H. S. ..... Minneapolis
Dierkes, G. J. ..... Rollingstone
Diessner, H. D. ..... Minneapolis
Ditmeier, L. M. G. ..... Jasper
Dittman, G. C. ..... St. Paul
Dixon, C. F. ..... Rochester
Dixon, R. K. ..... Rochester
Dodge, F. A. ..... LeSueur
Dohm, A. J. ..... St. Paul
Dolder, F. C. ..... Eyota
Dolan, C. P. ..... Worthington
Doleman, N. F. ..... Tintah
Doms, H. C. ..... Slayton
Donald, J. M. ..... Rochester
Donaldson, C. A. ..... Mesa, Arizona
Donohue, P. F. ..... St. Paul
Doolittle, L. E. ..... Duluth
Dordal, J. ..... Sacred Heart
Dorge, R. I. ..... Minneapolis
Dornblaser, H. B. ..... Minneapolis
Dorsey, G. C. ..... Minneapolis
Dovre, C. M. ..... St. Paul
Down, H. I. ..... Rochester
Dowswell, W. J. ..... Kerkhoven
Doxey, G. L. ..... Minneapolis
Doyle, G. C. ..... Duluth
Doyle, L. O. ..... Minneapolis
Drake, C. B. ..... St. Paul
Drake, C. R. ..... Minneapolis
Drake, F. A. ..... Lanesboro
Dredge, H. P. ..... Sandstone
Dreisbach, N. ..... Minneapolis
Drenning, F. C. ..... Duluth
Drips, D. G. ..... Rochester
Droegemuller, E. H. ..... Rochester
Drought, W. W. ..... Fergus Falls
Dubbe, F. H. ..... New Ulm
Du Bois, J. A. ..... Sauk Center
Du Bois, J. F. ..... Sauk Center
Duff, E. R. ..... Minneapolis
Dugan, L. F. ..... Faribault
Dukelow, D. A. ..... St. Charles
Dulude, Stephane ..... Dassel
Dungay, N. S. ..... Northfield
Dunlap, E. H. ..... Minneapolis
Dunlap, H. F. ..... Rochester
Dunlop, A. H. ..... Crookston
Dunlop, J. G., Jr. ..... Rochester
Dunn, G. R. ..... Minneapolis
Dunn, J. N. ..... St. Paul
Dunne, G. P. ..... St. Paul
Durgin, F. L. ..... Winnebago
Duryea, Marbry ..... Minneapolis
Dutton, C. E. ..... Minneapolis
Dworsky, S. D. ..... Minneapolis
Dysterheft, A. F. ..... Gaylord

Earl, G. A. ..... St. Paul
Earl, R. O. ..... St. Paul
Eberlin, E. A. ..... Glenwood
Eby, C. B. ..... Spring Valley
Eckman, P. F. ..... Duluth
Eckstein, A. W. ..... Mankato
Edlund, G. ..... St. Paul
Edward, George ..... Canton
Edwards, G. C. ..... Grove City
Edwards, R. T. ..... Elysian
Egilsrud, Kristian ..... Minneapolis
Ehmke, W. C. ..... Willow River
Ehrenberg, C. J. ..... Minneapolis
Ehrlich, S. P. ..... Minneapolis
Eitel, G. D. ..... Minneapolis
Ekblad, J. W. ..... Duluth
Eklund, E. J. ..... Norwood
Eklund, W. J. ..... Duluth
Elias, F. J. ..... Duluth
Ellingson, A. R. ..... Detroit Lakes
Ellison, D. E. ..... Minneapolis
Ellison, F. E. ..... Monticello
Elsey, E. M. ..... Glenwood
Elsey, J. R. ..... Glenwood
Ely, O. S. ..... South St. Paul
Emanuel, K. W. ..... Duluth
Emerson, E. C. ..... St. Paul
Emmerson, W. S. ..... Mayer
Emmett, J. L. ..... Rochester
Emmons, W. F. ..... Rochester
Emond, A. J. ..... Minneapolis
Endress, E. K. ..... St. Paul
Engberg, E. J. ..... St. Paul
Engh, Sigired ..... Jackson
Engstrand, O. J. ..... Warren
Engstrom, F. A. ..... Wanamingo
Engstrom, G. F. ..... Belgrade
Eppard, R. M. ..... Cloquet
Erb, F. A. ..... Minneapolis
Erdmann, C. A. ..... Minneapolis
Erickson, R. F. ..... Minneapolis
Ericson, J. G. ..... Minneapolis
Ericson, R. M. ..... Minneapolis
Ericson, Swan ..... Le Sueur
Ernest, G. C. ..... St. Paul
Ertel, E. Q. ..... Ellendale
Eshelby, E. C. ..... St. Paul
Esser, John ..... Perham
Estrem, C. O. ..... Fergus Falls
Estrem, T. A. ..... Hibbing
Eusterman, G. B. ..... Rochester
Evans, E. T. ..... Minneapolis
Evans, R. D. ..... Minneapolis
Evans, V. I. ..... Rochester
Evarts, A. B. ..... Rochester
Everlof, J. L. ..... Minneapolis
Ewbank, J. N. ..... Minneapolis
Ewing, C. F. ..... Wheaton
Exley, E. W. F. ..... Minneapolis

Fahey, E. W. ..... St. Paul
Fahr, G. E. ..... Minneapolis
Fansler, W. A. ..... Minneapolis
Farr, R. E. ..... Minneapolis
Faust, L. S. ..... Rochester
Fauster, J. U., Jr. ..... Rochester
Fawcett, C. E. ..... Stewartville
Fawcett, K. R. ..... Duluth
Feeney, J. M. ..... Minneapolis
Fellows, M. F. ..... Duluth
Fenger, E. ..... Oak Terrace
Ferguson, J. C. ..... St. Paul
Ferreira, G. J. ..... Duluth
Fetter, Mary ..... Winona
Fetterly, Warren ..... Minneapolis
Fesler, H. H. ..... St. Paul
Figi, F. A. ..... Rochester
Fiksdal, M. J. ..... Willmar
Fink, L. W. ..... Minneapolis
Fink, W. H. ..... Minneapolis
Finney, W. P., Jr. ..... Rochester
Fischer, H. P. ..... Shakopee
Fischer, M. McC. ..... Duluth
Fischer, P. M. ..... Shakopee
Fitzgerald, D. F. ..... Minneapolis
Fitzgerald, E. T. ..... Morris
Fjeldstad, C. A. ..... Minneapolis
Flagstad, A. E.* ..... Minneapolis
Fleischhauer, D. S. ..... Wabasha
Flinn, T. E. ..... Redwood Falls
Flom, A. O. ..... Chisago City
Flores, O. T. ..... Dodge Center
Flower, W. Z. ..... Minneapolis
Fogarty, C. W. ..... St. Paul
Foley, F. E. B. ..... St. Paul
Folken, F. G. ..... Albert Lea
Folta, John ..... Ceylon
Foor, C. G. ..... Rochester
Forbes, R. S. ..... Duluth
Ford, B. C. ..... Marshall
Ford, Frances A. ..... Rochester
Fortin, H. J. ..... Rochester
Fortney, G. O. ..... Zumbrota

*Deceased.

Foshager, H. T. ..... Clara City
Fowler, L. H. ..... Minneapolis
Fox, John M. ..... Minneapolis
Franchere, F. W. ..... Lake Crystal
Francis, D. W. ..... Faribault
Fredericks, G. M. ..... Minneapolis
Freeborn, J. A. ..... Fergus Falls
Freed, O. J. R. ..... Cokato
Freeman, C. D. ..... St. Paul
Freeman, G. H. ..... St. Peter
Freeman, J. P. ..... Albert Lea
Freeman, W. L. ..... St. Cloud
Freligh, W. P. ..... Albert Lea
Fricke, R. E. ..... Rochester
Friedell, A. ..... Minneapolis
Friesleben, Wm. ..... Sauk Rapids
Frisch, F. P. ..... Willmar
Fritsche, Albert ..... New Ulm
Fritsche, C. J. ..... New Ulm
Fritsche, L. A.* ..... New Ulm
Froehlich, H. W. ..... Minneapolis
Frost, E. H. ..... Willmar
Frost, H. T. ..... Wadena
Frost, R. H. ..... Wabasha
Fugina, G. R. ..... Mankato
Fulcher, O. H. ..... Rochester
Fulton, J. F.* ..... St. Paul
Funk, V. K. ..... Oak Terrace

Gaarde, F. W. ..... Rochester
Gager, E. C. ..... St. Paul
Gaines, E. C. ..... Buffalo Lake
Gallagher, B. J. ..... Waseca
Gamble, J. W. ..... Albert Lea
Gamble, P. M. ..... Albert Lea
Gamble, R. M. ..... Albert Lea
Gammell, J. H. ..... Minneapolis
Garbrecht, Arthur ..... St. Paul
Gardiner, D. G. ..... St. Paul
Gardner, E. L. ..... Minneapolis
Gardner, V. H. ..... Fairmont
Gardner, W. P. ..... St. Paul
Garlock, A. V. ..... Bemidji
Garlock, D. H. ..... Bemidji
Gault, C. C.* ..... Owatonna
Geer, E. K. ..... St. Paul
Gehlen, J. N. ..... St. Paul
Geist, E. S. ..... Minneapolis
Geist, G. A. ..... St. Paul
Gelz, J. J. ..... St. Cloud
Gerber, M. P. ..... Brainerd
Germo, Chas. ..... Balaton
Ghent, C. H. ..... St. Paul
Ghent, M. M. ..... St. Paul
Ghormley, R. K. ..... Rochester
Gibbons, F. C. ..... Comfrey
Gibbs, E. C. ..... St. Paul
Gibson, G. G. ..... Rochester
Giere, E. O. ..... Minneapolis
Giere, J. C. ..... Minneapolis
Giere, R. W. ..... Benson
Giere, S. W. ..... Benson
Giesen, A. F. ..... Starbuck
Giessler, P. W. ..... Minneapolis
Giffin, H. Z. ..... Rochester
Gilfillan, J. S. ..... St. Paul
Gilles, F. L. ..... Minneapolis
Gillespie, J. B. ..... Rochester
Gillespie, M. G. ..... Duluth
Gillespie, N. H. ..... Duluth
Ginsberg, Harry ..... Minneapolis
Ginsberg, Wm. ..... St. Paul
Goblirsch, A. P. ..... Sleepy Eye
Goeckerman, W. H. ..... Rochester
Goehrs, H. W. ..... St. Cloud
Goldberg, I. M. ..... Minneapolis
Goldberg, S. L. ..... Rochester
Golden, C. M. ..... Tyler
Goltz, E. V. ..... St. Paul
Goodman, C. E. ..... Virginia
Gosslee, G. L. ..... Moorhead
Gowan, L. R. ..... Duluth
Graham, A. S. ..... Rochester
Graham, David ..... Duluth
Graham, Robert ..... Duluth
Graham, R. D. ..... Duluth
Graham, W. D. ..... Hanska
Grant, H. W. ..... St. Paul
Gratzek, F. R. ..... Minneapolis
Gratzek, Thos. ..... St. Paul
Grave, Floyd ..... Minneapolis
Graves, W. N. ..... Duluth
Grawn, F. A. ..... Northome
Gray, F. D. ..... Marshall
Gray, H. K. ..... Rochester
Green, E. K. ..... Minneapolis
Greene, C. H. ..... Rochester
Greene, H. H. ..... Austin
Greene, W. P. ..... Minneapolis
Greisheimer, Esther M. ..... Minneapolis
Grimes, A. E., Jr. ..... Rochester
Grimes, H. B. ..... Madelia
Grimes, Marian ..... Minneapolis

Grinnell, W. B. ..... Preston
Grise, W. B. ..... Austin
Grogan, J. S. ..... Wadena
Gronvall, P. R. ..... Minneapolis
Groschupf, T. P. ..... Bemidji
Grose, F. N. ..... Clarissa
Gullixson, A. ..... Albert Lea
Gully, R. J. ..... St. Peter
Gunderson, N. A. ..... Minneapolis
Gruenhagen, A. P. ..... St. Paul
Gustafson, H. T. ..... Minneapolis

Habein, H. C. ..... Rochester
Haberman, E. ..... Osakis
Hacking, F. H. ..... Minneapolis
Haddow, N. W. ..... Minneapolis
Haessly, S. B. ..... Faribault
Hagaman, G. K. ..... St. Paul
Hagen, G. L. ..... Minneapolis
Hagen, H. O. ..... New Richland
Hagen, O. E. ..... Butterfield
Hagen, O. J. ..... Moorhead
Haggard, G. D. ..... Minneapolis
Haines, J. H. ..... Stillwater
Haines, S. F. ..... Rochester
Hale, D. E. ..... Rochester
Halgren, H. A. ..... Watertown
Hall, A. R. ..... St. Paul
Hall, H. H. ..... St. Paul
Hall, J. M. ..... Minneapolis
Hall, S. S. ..... Minneapolis
Hallberg, C. A. ..... Minneapolis
Hallenbeck, D. F. ..... Rochester
Halloran, Walter ..... Jackson
Halpern, D. J. ..... Battle Lake
Halpin, J. E. ..... Rush City
Hamel, A. L. ..... Minneapolis
Hamilton, A. S. ..... Minneapolis
Hamlin, G. B. ..... Minneapolis
Hammermeister, T. F. ..... New Ulm
Hammes, E. M. ..... St. Paul
Hammond, A. J. ..... Minneapolis
Hammond, J. F. ..... St. Paul
Hand, W. R. ..... Elbow Lake
Haney, C. L. ..... Duluth
Hannah, H. B. ..... Minneapolis
Hansen, C. O. ..... Minneapolis
Hansen, Erling ..... Minneapolis
Hansen, Olga S. ..... Minneapolis
Hanson, A. M. ..... Faribault
Hanson, E. C. ..... Park Rapids
Hanson, H. J. ..... Minneapolis
Hanson, H. V. ..... St. Paul
Hanson, W. A. ..... Minneapolis
Happe, L. J. ..... Marshall
Hare, E. R. ..... Minneapolis
Harmeier, J. W. ..... Rochester
Harmon, G. E. ..... St. Paul
Harper, F. R. ..... Rochester
Harriman, L. ..... Howard Lake
Harrington, C. D. ..... Minneapolis
Harrington, F. E. ..... Minneapolis
Harrington, S. W. ..... Rochester
Harris, C. N. ..... Nashwauk
Harris, M. T. ..... Rochester
Harrison, P. W. ..... Rochester
Hart, W. E. ..... Monticello
Hartfiel, W. F. ..... St. Paul
Hartley, E. C., Jr. ..... St. Paul
Hartman, H. R. ..... Rochester
Hartzell, T. B. ..... Minneapolis
Haskell, A. D. ..... Alexandria
Hassett, R. G. ..... Mankato
Hastings, D. R. ..... Minneapolis
Hatch, W. E. ..... Duluth
Hathaway, S. J. ..... Proctor
Hauge, M. I. ..... Clarkfield
Hauge, M. M. ..... Clarkfield
Hauser, V. P. ..... St. Paul
Havens, F. Z. ..... Rochester
Havens, J. G. W. ..... Austin
Haverfield, A. R. ..... Minneapolis
Hawkins, V. J. ..... St. Paul
Hawkinson, J. P. ..... Crosby
Hawkinson, L. F. ..... Brainerd
Hawkinson, R. P. ..... Minneapolis
Hayes, J. M. ..... Minneapolis
Hayes, M. F. ..... Nashwauk
Haynes, A. L. ..... Faribault
Haynes, M. H. ..... Menahga
Hazen, S. F. ..... Rochester
Head, Douglas P. ..... Minneapolis
Head, G. D. ..... Minneapolis
Healy, R. T. ..... Pierz
Hearn, W. O. ..... Minneapolis
Heath, A. C. ..... St. Paul
Heazlett, W. A. ..... Rochester
Hebeisen, M. B. ..... Carver
Hebert, W. H. J. ..... Rochester
Heck, F. J. ..... Rochester
Heck, W. W. ..... St. Paul
Hedback, A. E. ..... Minneapolis
Hedberg, G. A. ..... Nopeming

Hedenstrom, F. G. ..... St. Paul
Hedenstrom, L. H. ..... Cambridge
Hegge, O. H. ..... Austin
Hegge, R. S. ..... Austin
Heiberg, E. A. ..... Fergus Falls
Heim, R. R. ..... Minneapolis
Heimark, J. H. ..... Moorhead
Heimark, J. J. ..... Fairmont
Heimark, O. E. ..... Duluth
Heise, W. F. C. ..... Winona
Helk, H. H. ..... Minneapolis
Helland, G. M. ..... Spring Grove
Helland, J. W. ..... Spring Grove
Helmholz, H. F. ..... Rochester
Hempstead, B. E. ..... Rochester
Hemstead, Werner ..... St. Cloud
Hench, P. S. ..... Rochester
Henderson, A. J. ..... Kiester
Henderson, M. S. ..... Rochester
Hendrickson, J. F. ..... Minneapolis
Hendrickson, R. R. ..... Wadena
Hengstler, W. H. ..... St. Paul
Henney, W. H. ..... McIntosh
Henry, C. E. ..... Minneapolis
Henry, M. O. ..... Minneapolis
Hensel, C. N. ..... St. Paul
Henslin, A. E. ..... LeRoy
Herbert, W. L. ..... Maynard
Herbolsheimer, A. J. ..... Minneapolis
Herbst, W. P. ..... Minneapolis
Herman, A. L. ..... Minneapolis
Herrmann, E. T. ..... St. Paul
Hermanson, P. E. ..... Hendricks
Hertel, G. E. ..... Austin
Heseltine, V. G. ..... Taylors Falls
Hesselgrave, S. S. ..... St. Paul
Hewitt, Edith S. ..... Rochester
Hewson, W. J. ..... Stillwater
Heyerdale, O. C. ..... Rochester
Hiebert, J. P. ..... Minneapolis
Hielscher, J. A. ..... Mankato
Higbee, P. A. ..... Minneapolis
Higgins, J. H. ..... Minneapolis
Hilding, Anderson C. ..... Rochester
Hilger, A. W. ..... St. Paul
Hilger, D. D. ..... St. Paul
Hilger, L. A. ..... St. Paul
Hill, Eleanor J. ..... Minneapolis
Hill, F. E. ..... Duluth
Hilton, J. M. ..... Rochester
Hines, E. A., Jr. ..... Rochester
Hiniker, L. P. ..... St. Paul
Hiniker, Peter J. ..... Le Sueur
Hirschboeck, F. J. ..... Duluth
Hirschfelder, A. D. ..... Minneapolis
Hirschfield, Adolph ..... Minneapolis
Hirschfield, M. S. ..... Duluth
Hirshfield, F. R. ..... Minneapolis
Hitchings, W. S. ..... Lakefield
Hoaglund, A. W. ..... Minneapolis
Hobbs, C. A. ..... Minneapolis
Hochfilzer, J. J. ..... St. Paul
Hodapp, R. J. ..... Willmar
Hodge, S. V. ..... Minneapolis
Hodgson, H. H. ..... Crookston
Hoerner, M. T. ..... Rochester
Hoff, Alfred ..... St. Paul
Hoffman, M. H. ..... St. Paul
Hoidale, A. D. ..... Tracy
Hoiland, A. S. ..... Minneapolis
Holbrook, J. S. ..... Mankato
Holcomb, J. T. ..... St. Paul
Holcomb, O. W. ..... St. Paul
Holderman, J. W. ..... Duluth
Holdridge, George ..... Foley
Holen, T.* ..... Minneapolis
Holl, P. M. ..... Minneapolis
Hollands, W. H. ..... Fisher
Holm, H. H. ..... Glencoe
Holmberg, L. J. ..... Canby
Holmes, A. E. ..... Rush City
Holmstrom, C. H. ..... Warren
Holst, C. F. ..... Little Falls
Holst, J. B. ..... Little Falls
Holt, J. E. ..... St. Paul
Holt, W. B. ..... Minneapolis
Holte, Halvor ..... Crookston
Holtan, Theodore ..... Waterville
Horton, B. T. ..... Rochester
Hovde, Rolf ..... Winthrop
Houkom, Bjarne ..... Fergus Falls
House, Z. E. ..... Cass Lake
Houston, C. A. ..... Park Rapids
Howard, M. I. ..... Mankato
Howard, W. H. ..... Minneapolis
Howard, W. S. ..... St. Paul
Howell, W. L. ..... Rochester
Hubin, E. G. ..... Deerwood
Huenekens, E. J. ..... Minneapolis
Huffington, H. L. ..... Mankato
Hughes, L. D. ..... Minneapolis
Hullsiek, R. B. ..... St. Paul
Hultkrans, J. C. ..... St. Paul

*Deceased.

Hultkrans, R. E. ..... Minneapolis
Humphrey, E. W. ..... Moorhead
Humphrey, W. R. ..... Stillwater
Hunt, F. N. ..... Fairmont
Hunt, H. E. ..... St. Paul
Hunt, R. C. ..... Fairmont
Hunte, A. F. ..... Bylos, Arizona
Hurd, Annah ..... Minneapolis
Hurt, H. H. ..... Rochester
Huseby, H. W. ..... Floodwood
Hutchinson, C. J. ..... Minneapolis
Hutchinson, Henry ..... New London
Huxley, F. R. ..... Faribault
Hyde, T. I. ..... Rochester
Hymes, Charles ..... Minneapolis
Hynes, James ..... Minneapolis
Hynes, J. E. ..... Minneapolis

Iber, F. C. ..... Rochester
Ide, A. W. ..... St. Paul
Ikeda, Kano ..... St. Paul
Imes, P. R. ..... Rochester
Irvine, H. G. ..... Minneapolis
Irwin, Alexander F. ..... Minneapolis

Jackson, C. M. ..... Minneapolis
Jacobs, A. C. ..... Elmore
Jacobs, J. C. ..... Willmar
Jacobson, Clarence ..... Chisholm
Jacquot, G. L. ..... Marshall
Jamieson, Earl ..... Walnut Grove
Jamieson, E. F. ..... Brainerd
Jennings, F. L. ..... Oak Terrace
Jennings, Mary H. ..... Minneapolis
Jensen, A. H. ..... Hutchinson
Jensen, Harry ..... Minneapolis
Jensen, H. H. ..... Atwater
Jensen, M. J. ..... Minneapolis
Jensen, T. J. ..... Duluth
Johnson, A. B. ..... Minneapolis
Johnson, A. E. ..... Red Wing
Johnson, A. E. ..... Minneapolis
Johnson, Asa M. ..... St. Paul
Johnson, C. E. ..... St. Paul
Johnson, C. M. ..... Dawson
Johnson, Ellsworth ..... Rochester
Johnson, E. W. ..... Bemidji
Johnson, H. C. ..... St. Paul
Johnson, H. M. ..... Dawson
Johnson, H. P. ..... Fairmont
Johnson, H. W. E. ..... Rochester
Johnson, J. A. ..... St. Paul
Johnson, James A. ..... Minneapolis
Johnson, Julius ..... Minneapolis
Johnson, N. A. ..... Minneapolis
Johnson, Norman ..... Minneapolis
Johnson, O. H. ..... Echo
Johnson, O. V. ..... Fergus Falls
Johnson, R. A. ..... Minneapolis
Johnson, Ray G. ..... St. Paul
Johnson, S. M. ..... Minneapolis
Johnson, T. H. ..... St. Paul
Johnson, V. P. ..... Delano
Johnson, Walfred ..... Sauk Center
Johnson, W. R. ..... Rochester
Johnson, W. E. ..... Morgan
Johnson, Y. T. ..... Minneapolis
Jones, A. W. ..... Red Wing
Jones, D. C. ..... St. Paul
Jones, E. M. ..... St. Paul
Joues, G. M. ..... Minneapolis
Jones, H. W. ..... Minneapolis
Jones, R. N. ..... St. Cloud
Jordan, L. S. ..... Granite Falls
Josewich, Alexander ..... Minneapolis
Josewski, R. J. ..... Stillwater
Joyce, G. L. ..... Stewartville
Joyce, G. T. ..... Rochester
Judd, E. S. ..... Rochester
Juergens, H. M. ..... Belle Plaine
Juliar, R. O. ..... St. Clair

Kaasa, L. J. ..... Albert Lea
Kadesky, David ..... St. Paul
Kahala, Arthur ..... Crookston
Kalinoff, D. ..... Stillwater
Kamman, G. R. ..... St. Paul
Kamp, B. A. ..... Albert Lea
Kannary, E. L. ..... St. Paul
Kanne, C. W. ..... Faribault
Karn, B. R. ..... Ortonville
Kaufman, W. C. ..... Appleton
Kegaries, D. L. ..... Rochester
Keith, H. M. ..... Rochester
Keith, N. M. ..... Rochester
Kelby, G. M. ..... Minneapolis
Kelling, L. F. ..... Lakefield
Kellum, E. L. ..... Rochester
Kelly, B. W. ..... Aitkin
Kelly, J. V. ..... St. Paul
Kelly, P. H. ..... St. Paul
Kelsey, C. G. ..... Hinckley
Kemp, A. F. ..... Mankato

Kemp, M. W. ..... Fergus Falls
Kendahl, A. M. ..... Jasper
Kenefick, E. V. ..... St. Paul
Kennedy, C. C. ..... Minneapolis
Kennedy, Jane F. ..... Minneapolis
Kennedy, R. L. J. ..... Rochester
Kennedy, R. R. ..... Minneapolis
Kennedy, W. A. ..... St. Paul
Kenny, H. F. ..... St. Paul
Kenyon, Paul ..... Wadena
Kepler, E. J. ..... Rochester
Kerlan, S. Z. ..... Aitkin
Kernohan, J. W. ..... Rochester
Kerschbaumer, Louisa ..... St. Peter
Kesting, Herman ..... St. Paul
Keyes, C. R. ..... Duluth
Keyes, E. D. ..... Winona
Keyes, J. D. ..... Winona
Kibbe, O. A. ..... Minneapolis
Kierland, P. E. ..... Alexandria
Kiesling, I. H. ..... Nashwauk
Kilbride, E. A. ..... Worthington
Kilbride, J. S. ..... Canby
Kilbourne, A. F. ..... Rochester
King, E. A. ..... Minneapolis
King, G. L. ..... St. Paul
King, H. T. ..... Minneapolis
King, W. R. ..... Minneapolis
King, W. S. ..... Eveleth
King, Z. P. ..... St. Paul
Kinsella, T. J. ..... Oak Terrace
Kirk, G. P. ..... East Grand Forks
Kirklin, B. R. ..... Rochester
Kirklin, O. L. ..... Rochester
Kistler, A. J. ..... Minneapolis
Kistler, A. S. ..... St. Paul
Kistler, C. M. ..... Minneapolis
Kittelson, T. N. ..... Fergus Falls
Klaveness, E. ..... St. Paul
Klein, Harry ..... Duluth
Klein, H. N. ..... St. Paul
Klima, W. W. ..... Stewart
Kliman, F. E. ..... Duluth
Knauff, M. K. ..... St. Paul
Knapp, F. N. ..... Duluth
Knight, R. R. ..... Minneapolis
Knight, R. T. ..... Minneapolis
Koch, J. C. ..... Minneapolis
Koelsche, G. A. ..... Rochester
Koepcke, G. M. ..... Minneapolis
Kohlbry, C. O. ..... Duluth
Kohler, D. W. ..... St. Joseph
Kolars, J. J. ..... Le Center
Koller, H. M. ..... Minneapolis
Koller, L. R. ..... Minneapolis
Kolset, C. D. ..... Sanborn
Kooiker, H. J. ..... Milaca
Koop, S. H. ..... Richmond
Kotchevar, F. R. ..... Eveleth
Kraft, Peter ..... Duluth
Krantz, C. I. ..... Duluth
Kremer, Walter J.* ..... Minneapolis
Kreuzer, T. C. ..... Owatonna
Kriedt, Daniel ..... Minneapolis
Kucera, F. J. ..... Hopkins
Kucera, W. J. ..... Minneapolis
Kuhlmann, August ..... Melrose
Kullman, H. J. ..... Rochester
Kuske, A. W. ..... Faribault
Kusske, A. L. ..... New Ulm
Kuth, J. R. ..... Duluth
Kvitrud, G. ..... St. Paul

Laird, A. T. ..... Nopeming
Lajoie, J. M. ..... Minneapolis
Lamont, J. G. ..... Nopeming
Lane, Laura A. ..... Northfield
Langenderfer, F. V. ..... St. Paul
Langhoff, A. H. ..... Glencoe
Lannin, J. C. ..... Mabel
Lapierre, A. P. ..... Minneapolis
Lapierre, C. A. ..... Minneapolis
Lapierre, J. T. ..... Minneapolis
Larsen, C. L. ..... St. Paul
Larsen, O. O. ..... Detroit Lakes
Larson, A. L. ..... Detroit Lakes
Larson, C. M. ..... Minneapolis
Larson, L. J. ..... Bagley
Larson, L. M. ..... Rochester
Larson, L. M. ..... Oak Terrace
Larson, P. N. ..... Rochester
Laughlin, J. T. ..... Grey Eagle
Laurent, A. A. ..... Minneapolis
La Vake, R. T. ..... Minneapolis
Lax, M. H. ..... St. Paul
Lazar, H. L. ..... Minneapolis
Leahy, Bartholomew ..... St. Paul
Learmonth, J. R. ..... Rochester
Leavenworth, R. O. ..... St. Paul
Leavitt, H. H. ..... Minneapolis
Lebowske, J. A. ..... Minneapolis
Leck, C. C. ..... Austin
Leckband, Norbert ..... Buhl

Leddy, E. T. ..... Rochester
Lee, H. M. ..... Minneapolis
Lee, J. L. ..... Watertown
Lee, T. G. ..... Minneapolis
Lee, W. A. ..... Fergus Falls
Lee, Walter N. ..... Madison
Leibold, H. H. ..... Parkers Prairie
Leitch, Archibald ..... St. Paul
Leitch, N. M. ..... Warroad
Leggett, Elizabeth Ann ..... Minneapolis
Leland, H. R. ..... Minneapolis
Leland, J. T. ..... Herman
Leland, M. N. ..... Minneapolis
Lemon, W. S. ..... Rochester
Lenander, M. E. ..... St. Peter
Lende, Norman ..... Faribault
Lendrum, F. C. ..... Rochester
Lenont, C. B. ..... Virginia
Leonard, G. J. ..... St. Paul
Leonard, L. J. ..... Minneapolis
Leopard, B. A. ..... Albert Lea
Lepak, F. J. ..... Duluth
Lepak, J. A. ..... St. Paul
Lerch, William ..... Cable, Wis.
Lester, Garra L. ..... Rochester
Leven, N. L. ..... Rochester
Levin, Bert ..... St. Paul
Levine, N. M. ..... Minneapolis
Lewis, A. J. ..... Henning
Lewis, C. B. ..... St. Cloud
Lewis, W. W. ..... St. Paul
Lexa, F. J. ..... Lonsdale
Libert, J. N. ..... St. Cloud
Lichtenstein, H. ..... Winona
Lick, C. L. ..... St. Paul
Liedloff, A. G. ..... Mankato
Liffrig, W. W. ..... Goodhue
Lillehei, E. J. ..... Minneapolis
Lillie, H. I. ..... Rochester
Lillie, W. I. ..... Rochester
Lima, Ludvig ..... Montevideo
Lind, C. J. ..... Minneapolis
Lindahl, M. J. ..... Winthrop
Lindberg, A. L. ..... Wheaton
Lindquist, R. H. ..... Minneapolis
Linner, H. P. ..... Minneapolis
Linton, W. B. ..... Minneapolis
Litman, A. B. ..... Minneapolis
Litman, S. N. ..... Duluth
Little, W. J. ..... St. Paul
Litzenberg, J. C. ..... Minneapolis
Lloyd, H. J. ..... Mankato
Lochead, D. C. ..... Rochester
Locken, O. E. ..... Crookston
Lodmell, E. A. ..... Sebeka
Logan, A. H. ..... Rochester
Logan, F. W. ..... Blue Earth
Logefeil, R. C. ..... Minneapolis
Lommen, P. A. ..... Austin
Loney, W. R. R. ..... Rochester
Long, Jesse ..... Minneapolis
Loofbourrow, E. H. ..... Keewatin
Loomis, E. A. ..... Minneapolis
Love, F. A. ..... Carlos
Love, J. G. ..... Rochester
Lowe, E. R. ..... South St. Paul
Lowe, T. A. ..... South St. Paul
Lowe, Thomas ..... Pipestone
Luden, Georgine ..... Victoria, B. C., Can.
Luedtke, G. H. ..... Fairmont
Lum, C. E. ..... Duluth
Lundgren, A. C. ..... Minneapolis
Lundholm, A. M. ..... St. Paul
Lundquist, E. F. ..... Minneapolis
Lundy, J. S. ..... Rochester
Lynch, M. J. ..... Minneapolis
Lynde, O. G. ..... Thief River Falls
Lyon, E. P. ..... Minneapolis
Lyon, J. D. ..... Minneapolis
Lysne, Henry ..... Minneapolis

McBeath, E. C. ..... New York, N. Y.
McBroom, D. E. ..... Cambridge
McCarthy, Donald ..... Minneapolis
McCarthy, W. J. ..... Madelia
McCarthy, W. R. ..... St. Paul
McCartney, J. S. ..... Minneapolis
McCarty, P. D. ..... Ely
McCarty, W. C. ..... Rochester
McCaughan, J. M. ..... Rochester
McClanahan, J. H. ..... White Bear
McClanahan, T. S. ..... White Bear
McCloud, C. N. ..... St. Paul
McComb, C. F. ..... Duluth
McCoy, Mary K. ..... Duluth
McCrea, J. M. ..... Fulda
McCuskey, C. F. ..... Rochester
McDaniel, Orianna ..... Minneapolis
McDaniel, S. P. ..... Mountain Iron
McDonald, A. L. ..... Duluth
McDonnell, C. H.* ..... Winona
McDowell, J. P. ..... St. Cloud
McEachran, A. ..... Minneapolis

*Deceased.

McFarland, A. H. Minneapolis
McGandy, R. F. Minneapolis
McGeary, G. E. Minneapolis
McGiffert, E. N.* Duluth
McGroarity, J. J. Easton
McGuigan, H. T. Red Wing
McHaffie, O. L. Duluth
McHugh, R. F. Aitkin
McIntire, H. M. Waseca
McIntyre, George Minneapolis
McIntyre, J. A. Owatonna
McIver, B. A. Lowry
McKaig, C. B. Pine Island
McKechnie, Wilfred St. Peter
McKenna, J. K. Austin
McKeon, James St. Paul
McKeon, J. O. Montgomery
McKeon, Owen St. Paul
McKeown, E. G. Pipestone
McKinlay, C. A. Minneapolis
McKinley, J. C. Minneapolis
McKinney, F. S. Minneapolis
McLane, Evelyn G. Sleepy Eye
McLane, W. O. Sleepy Eye
McLaren, Jennette M. St. Paul
McLaughlin, E. M. Winona
McLeod, J. L. Bovey
McNevin, C. F. St. Paul
McNutt, J. R. Duluth
McPheeters, H. O. Minneapolis
McQuiston, J. S. Rochester

MacDonald, A. E. Minneapolis
MacDonald, D. A. Minneapolis
MacDonald, I. C. Minneapolis
Macfarlane, P. H. Chisholm
Mach, F. B. Minneapolis
Macklin, W. E., Jr. Litchfield
Macnie, J. S. Minneapolis
MacRae, G. C. Duluth
Madden, J. F. St. Paul
Maertz, W. F. New Prague
Magath, T. B. Rochester
Magee, H. R. Rochester
Magie, W. H. Duluth
Magiera, Estelle A. Minneapolis
Magney, F. H. Duluth
Mahowald, A. Albany
Major, S. G. Rochester
Maland, C. O. Minneapolis
Manley, J. R. Duluth
Manley, L. V. Albert Lea
Mann, A. T. Minneapolis
Mann, F. C. Rochester
Manson, F. M. Worthington
Marcley, W. J. Minneapolis
Marcum, E. H. Bemidji
Mariette, E. S. Oak Terrace
Mark, D. B. Minneapolis
Mark, Hilbert Ah-Gwah-Ching
Marsh, H. L. Eveleth
Martin, E. T. Duluth
Martin, T. P. Arlington
Martin, W. C. Duluth
Martin, W. J., Jr. Rochester
Martinson, C. J. Wayzata
Matchan, G. R. Minneapolis
Martineau, J. L. St. Paul
Massey, B. D. Rochester
Masson, D. M. Rochester
Masson, J. C. Rochester
Matthews, Justus Minneapolis
Mattill, P. M. Oak Terrace
Mattison, P. A. Winona
Mattson, C. H. St. Paul
Maxeiner, S. R. Minneapolis
May, W. H. Minneapolis
Mayland, M. L. Faribault
Mayne, R. M. Duluth
Mayo, C. H. Rochester
Mayo, C. W. Rochester
Mayo, J. G. Rochester
Mayo, W. J. Rochester
Maytum, C. K. Rochester
Meade, J. R. Rochester
Meierding, W. A. New Ulm
Meighen, J. W. Ulen
Meinert, A. E. Winona
Meland, E. L. Rochester
Melby, Benedik Blooming Prairie
Mellby, O. F. Thief River Falls
Melzer, G. R. Lyle
Mercer, S. R. Rochester
Mercil, W. F. Crookston
Merkert, C. E. Minneapolis
Merkert, G. I. Minneapolis
Merriman, L. L. Duluth
Mesker, G. H. Olivia
Messick, J. M. Rochester
Meyer, A. A. Melrose
Meyer, E. L. Minneapolis
Meyer, P. F. Faribault
Meyerding, E. A. St. Paul
Meyerding, H. W. Rochester
Michael, J. C. Minneapolis
Michelson, H. E. Minneapolis
Michie, T. C. Rochester
Miller, H. A. Fairmont
Miller, V. I. Mankato
Miller, W. A. New York Mills
Millet, R. F. Rochester
Mills, J. L. Winnebago
Mills, S. D. Rochester
Milton, J. S. Minneapolis
Miners, G. A. Deer River
Mitchell, A. B. Lansing, Mich.
Mitchell, R. S. Grand Meadow
Moe, R. J. Duluth
Moe, Thomas Moose Lake
Moen, J. K., Jr. Minneapolis
Moench, Mary Rochester
Moersch, F. P. Rochester
Moersch, H. J. Rochester
Moga, J. A. St. Paul
Mogilner, S. N. St. Paul
Mohardt, J. H. Rochester
Moir, W. W. Minneapolis
Molander, H. A. St. Paul
Monroe, P. B. Two Harbors
Montgomery, Jimmie Ethel Rochester
Montgomery, Hamilton Rochester
Mooney, L. P. Marble
Moorhead, M. B. Minneapolis
Moquin, Marie A. St. Paul
Moran, T. R. St. Paul
More, C. W. Eveleth
Moren, Edwin Minneapolis
Morey, J. B. Rochester
Morgan, S. F. Rochester
Moriarty, Cecile R. Minneapolis
Mork, B. O. Worthington
Morley, G. A. Crookston
Morrison, A. W. Minneapolis
Morrissey, F. B. St. Paul
Morrow, J. J. Austin
Morse, M. P. LeRoy
Morsman, L. W. Hibbing
Morss, C. R. Zumbrota
Mortenson, N. G. St. Paul
Morton, S. A. Milwaukee, Wis.
Moses, Joseph, Jr. Northfield
Moss, Myer N. St. Paul
Moyer, R. E. Bemidji
Moynihan, A. F. Sauk Center
Moynihan, T. J. St. Paul
Mroz, R. J. Rochester
Mueller, S. C. Rochester
Muller, R. T. St. Paul
Murdoch, J. M. Faribault
Murphy, I. J. Minneapolis
Murray, D. D.* Duluth
Murray, R. A. Duluth
Murray, S. E. Rochester
Mussey, R. D. Rochester
Myers, J. A. Minneapolis
Myers, Thomas St. Paul

Nagel, H. D. Waconia
Naegeli, A. E. St. Paul
Naegeli, Frank Fergus Falls
Nass, H. A. Mabel
Nathanson, M. H. Minneapolis
Nauth, W. W. Winona
Neher, F. H. St. Paul
Nehring, J. P. Preston
Nelson, C. P. Minneapolis
Nelson, E. H. Chisholm
Nelson, E. J. Owatonna
Nelson, Harvey Minneapolis
Nelson, H. E. Crookston
Nelson, H. S. Minneapolis
Nelson, L. A. St. Paul
Nelson, M. S. Granite Falls
Nelson, Nesmith Brainerd
Nelson, O. E. Minneapolis
Nelson, O. N. Battle Lake
Nelson, R. L. Duluth
Nelson, W. I. Underwood
Nelson, W. L. Rochester
Nethercott, E. G. Pine City
Neumann, C. A. Winona
New, G. B. Rochester
Newhart, Horace Minneapolis
Nicholson, M. A. Duluth
Nickerson, W. S. Faribault
Ninneman, N. N. Silver Lake
Nippert, H. T. St. Paul
Noble, J. F. St. Paul
Nordin, C. G. St. Paul
Nordin, G. T. Minneapolis
Norrgard, H. T. Milaca
Norris, G. H. Annandale
Nordland, Martin Minneapolis
Norman, J. F. Crookston
Norris, E. H. St. Paul
Noth, H. W. Minneapolis
Novak, E. E. New Prague
Nuessle, W. G. Springfield
Nusbaum, D. H. Jackson
Nutting, R. E. Duluth
Nye, Katherine A. St. Paul
Nye, Lillian L. St. Paul
Nystrom, Ruth Minneapolis

Oberg, C. M. Minneapolis
O'Brien, H. J.* St. Paul
O'Brien, W. A. Minneapolis
O'Connor, D. C. Eden Valley
O'Connor, L. J. St. Paul
O'Donnell, D. M. Ortonville
O'Donnell, J. E. Minneapolis
Oerting, Harry St. Paul
Offutt, Susan R. Rochester
Ogden, Warner St. Paul
Ohage, Justus, Jr. St. Paul
Ohage, Justus St. Paul
O'Hara, J. J.* Janesville
Ohlinger, L. B. Chicago, Ill.
Ohnstad, J. L. McIntosh
O'Leary, P. A. Rochester
Oliver, C. I. Graceville
Oliver, I. L. Graceville
Olson, A. E. Duluth
Olson, Archibald Hendricks
Olson, C. A. St. Paul
Olson, C. J. Belle Plaine
Olson, E. A. Pine Island
Olson, F. A. Minneapolis
Olson, J. W. Cokato
Olson, O. A. Minneapolis
Olson, R. G. Minneapolis
Olson, W. P. Gaylord
Onsgard, L. Kenneth Houston
Onsgard, L. K. Houston
Oppegaard, C. L. Crookston
Oppegaard, M. O. Crookston
Oredson, O. A. Duluth
O'Reilley, B. E. St. Paul
Ormond, Douglas Waconia
Osborne, Lida Mankato
Osburn, B. F. International Falls
Ostergren, E. W. St. Paul
Otto, H. C. Frazee
Overend, K. V. Hallock
Overton, L. M. Rochester
Owre, Oscar Minneapolis

Page, C. V. St. Paul
Page, R. L. St. Charles
Palmer, C. F. Albert Lea
Palmer, R. N.* Lanesboro
Palmer, W. L. Albert Lea
Paradis, W. G. Crookston
Parker, H. L. Rochester
Parker, O. W. Ely
Parks, A. H. Minneapolis
Parson, L. R. Elbow Lake
Parsons, J. G. Crookston
Passer, A. A. Olivia
Pattee, G. L. Rochester
Patterson, W. E. Minneapolis
Patterson, W. E. Westbrook
Patterson, W. L. Fergus Falls
Patmos, Martin Rochester
Paulsen, E. L. Minneapolis
Paulson, T. S. Fergus Falls
Pearce, N. O. Minneapolis
Pearson, F. R. St. Paul
Pearson, W. T. Finlayson
Pedersen, A. H. St. Paul
Pederson, Harold Minneapolis
Pederson, R. M. Minneapolis
Pemberton, J. de J. Rochester
Penhall, F. W. Morton
Pennie, D. F. Duluth
Peppard, T. A. Minneapolis
Perry, C. G. St. Paul
Perry, R. St. J. Minneapolis
Persons, C. E. Marshall
Pertl, A. L. Windom
Petersen, J. R. Minneapolis
Petersen, Thorvald Minneapolis
Peterson, A. A. Mora
Peterson, H. W. Minneapolis
Peterson, J. A. Red Wing
Peterson, M. C. St. Peter
Peterson, O. H. Minneapolis
Peterson, O. I. Cokato
Peterson, R. A. Vesta
Peterson, V. L. Rochester
Peterson, V. N. St. Paul
Peterson, W. C. Minneapolis
Petit, L. J. Minneapolis
Petraborg, H. T. Stillwater
Pettit, C. W. Minneapolis
Pfunder, M. C. Minneapolis
Phelps, A. G. St. Paul
Phelps, K. A. Minneapolis
Phillips, A. E. Delano

*Deceased.

Phillips, J. R. ..... Rochester
Phillips, W. H. ..... Jordan
Pierce, C. H. ..... Wadena
Pierson, Claude M.* ..... Wheaton
Piper, M. C. ..... Rochester
Piper, W. A. ..... Mountain Lake
Platou, E. S. ..... Minneapolis
Platt, F. B. ..... Battle Lake
Plondke, F. J. ..... St. Paul
Plonske, C. J. ..... Faribault
Plummer, H. S. ..... Rochester
Plummer, W. A. ..... Rochester
Poirier, J. A. ..... Forest Lake
Pollard, D. W. ..... Minneapolis
Pollock, L. W. ..... Rochester
Popp, W. C. ..... Rochester
Poppe, F. H. ..... Minneapolis
Portmann, W. C. ..... Jackson
Power, J. E. ..... Duluth
Prangen, A. D. ..... Rochester
Pratt, F. J. ..... Minneapolis
Pratt, J. A. ..... Minneapolis
Preine, I. A. ..... Minneapolis
Prendergast, H. J. ..... St. Paul
Prickman, L. E. ..... Rochester
Priestley, J. B. ..... Rochester
Priestley, J. T. ..... Rochester
Prim, J. A. ..... Minneapolis
Pritchard, D. B.* ..... Winona
Proshek, C. E. ..... Minneapolis

Quade, R. H. ..... Rochester
Quinby, T. F. ..... Minneapolis
Quist, H. W. ..... Minneapolis

Raadquist, C. S. ..... Hibbing
Radabaugh, R. C. ..... Hastings
Raihala, John ..... Virginia
Rains, J. M. ..... Willmar
Raiter, F. W. S. ..... Cloquet
Raiter, R. F. ..... Cloquet
Ramsey, W. R. ..... St. Paul
Randall, A. M. ..... Ashby
Randall, L. M. ..... Rochester
Rankin, F. W. ..... Rochester
Ransom, M. L. ..... Hancock
Rathbun, A. M. ..... Rice
Rathbun, C. A. ..... St. Cloud
Rebman, E. C. ..... Austin
Reed, C. A. ..... Minneapolis
Rees, S. P.* ..... Minneapolis
Regnier, E. A. ..... Minneapolis
Reineke, G. F. ..... New Ulm
Reiter, H. W. ..... Shakopee
Rentschler, E. B. ..... Rochester
Replogle, W. H. ..... Wabasha
Reynolds, J. S. ..... Minneapolis
Richards, E. T. F. ..... St. Paul
Richards, W. B. ..... St. Cloud
Richardson, Fred S. ..... Minneapolis
Richardson, H. E. ..... St. Paul
Richardson, W. J. ..... Fairmont
Richdorf, L. F. ..... Minneapolis
Ridgway, Alexander ..... South Haven
Ridgway, A. M. ..... Annandale
Ridgway, Florence ..... Minneapolis
Rieniets, J. H. ..... Rochester
Rigler, L. G. ..... Minneapolis
Rimer, E. W. ..... Breckenridge
Ringle, O. F. ..... Walker
Rishmiller, J. H. ..... Minneapolis
Risser, E. D. ..... Winona
Ritchie, H. P. ..... St. Paul
Rivers, A. B. ..... Rochester
Rixford, E. L. ..... Rochester
Rizer, R. I. ..... Minneapolis
Roan, C. M. ..... Minneapolis
Robb, E. F. ..... Minneapolis
Robbins, C. P. ..... Winona
Roberts, L. M. ..... Little Falls
Roberts, T. S. ..... Minneapolis
Roberts, W. B. ..... Minneapolis
Robertson, A. W.* ..... Litchfield
Robertson, H. E. ..... Rochester
Robertson, J. B. ..... Cottonwood
Robertson, P. A. ..... Austin
Robilliard, C. M. ..... Faribault
Robilliard, W. H.* ..... Faribault
Robins, C. R., Jr. ..... Rochester
Robinson, J. M. ..... Duluth
Robinson, L. W. ..... Rochester
Robitshek, E. C. ..... Minneapolis
Rochford, W. E. ..... Minneapolis
Rodda, F. C. ..... Minneapolis
Rodgers, C. L. ..... Minneapolis
Roehlke, A. B. ..... Elk River
Rogers, J. T. ..... St. Paul
Rogin, J. R. ..... Rochester
Roholt, C. L. ..... Waverly
Rood, D. C. ..... Duluth
Rose, J. T. ..... Lakefield
Rosen, S. ..... Minneapolis
Rosenberger, H. P. ..... St. Paul

Rosenfield, A. B. ..... Pequot
Rosenholtz, Burton ..... St. Paul
Rosenthal, Robert ..... St. Paul
Rosenow, E. C. ..... Rochester
Rosenwald, R. M. ..... Minneapolis
Ross, W. P. ..... Worthington
Rothenburg, J. C. ..... Springfield
Rothrock, J. L. ..... St. Paul
Rothschild, H. J. ..... St. Paul
Rosseau, Victor ..... Maple Lake
Roust, H. A. ..... Montevideo
Rowe, O. W. ..... Duluth
Rowe, W. H. ..... Minneapolis
Rowles, E. K. ..... Coleraine
Rowntree, L. G. ..... Rochester
Roy, J. A. ..... Red Lake Falls
Roy, Philemon ..... St. Paul
Rucker, C. W. ..... Minneapolis
Rucker, W. H. ..... Minneapolis
Rud, N. E. ..... Minneapolis
Rudell, G. L. ..... Minneapolis
Rudie, C. N. ..... Kenyon
Rudie, P. S. ..... Duluth
Ruffin, Willcox ..... Rochester
Ruhberg, G. N. ..... St. Paul
Rumpf, C. W. ..... Faribault
Rumpf, W. H. ..... Faribault
Russeth, A. N. ..... Minneapolis
Rutherford, W. C. ..... St. Paul
Rutledge, L. H. ..... Detroit Lakes
Ryan, J. J. ..... St. Paul
Ryan, M. E. ..... St. Paul
Ryan, W. J. ..... Duluth
Rynearson, E. H. ..... Rochester

Saarf, O. E. ..... Baudette
Sach-Rowitz, Alvin ..... McGregor
Sadler, W. P. ..... Minneapolis
Saffert, C. A. ..... New Ulm
Sahr, W. G. ..... Hutchinson
St. Cyr, K. J. ..... Osseo
Saliterman, B. I. ..... Janesville
Salt, C. G. ..... Minneapolis
Samson, E. R. ..... Chisholm
Sanderson, E. T. ..... Minneota
Sanford, A. H. ..... Rochester
Satersmoen, Theo. ..... Pelican Rapids
Sather, Allen ..... Fosston
Satterlund, Victor ..... St. Paul
Satterlee, H. W. ..... Lewiston
Savage, F. J. ..... St. Paul
Sawatzky, W. A. ..... Minneapolis
Schaaf, F. H. K. ..... Minneapolis
Schaefer, J. F. ..... Owatonna
Schaefer, S. ..... Winona
Schaefer, W. G. ..... Minneapolis
Schatz, F. J. ..... St. Cloud
Scheldrup, N. H. ..... Minneapolis
Scherer, C. A. ..... Duluth
Scherer, L. R. ..... Rochester
Scherer, R. G. ..... Rochester
Schimelpfenig, G. T. ..... Chaska
Schlesselman, George ..... Anoka
Schlesselman, J. T. ..... Mankato
Schmidt, Geo. F. ..... Minneapolis
Schmidt, P. A. ..... Good Thunder
Schmitt, A. F. ..... Minneapolis
Schmitt, S. C. ..... Minneapolis
Schneider, H. A. ..... Jordan
Schoch, J. L. ..... New Ulm
Schoch, R. B. ..... St. Paul
Schons, E. ..... St. Paul
Schoofs, G. E. ..... North Branch
Schottler, M. E. ..... Minneapolis
Schroder, C. H. ..... Duluth
Schuldt, F. C. ..... St. Paul
Schultz, J. A. ..... Albert Lea
Schulze, A. G. ..... St. Paul
Schussler, O. F. ..... Minneapolis
Schutz, E. S. ..... Mountain Lake
Schwartz, V. J. ..... Minneapolis
Schwyzer, Arnold ..... St. Paul
Schwyzer, Gustav ..... Minneapolis
Schwyzer, R. ..... Minneapolis
Scofield, C. L. ..... Benson
Scott, F. H. ..... Minneapolis
Seaberg, J. A. ..... Minneapolis
Seashore, D. E. ..... Duluth
Seashore, Gilbert ..... Minneapolis
Seeley, I. F. ..... Northfield
Seham, Max ..... Minneapolis
Seifert, O. J. ..... New Ulm
Selleseth, Iver ..... Minneapolis
Senkler, G. E. ..... St. Paul
Senn, E. W. ..... Owatonna
Serkland, J. C. ..... Rothsay
Serrurier, L. R. ..... Rochester
Sessions, J. C. ..... Minneapolis
Setzer, H. J. ..... St. Paul
Shaleen, A. W. ..... Hallock
Shane, J. H. ..... Rochester
Shannon, S. S. ..... Crosby
Shannon, W. R. ..... St. Paul

Shapiro, E. Z. ..... Duluth
Shapiro, M. J. ..... Minneapolis
Shaw, A. W. ..... Buhl
Shedlov, A. ..... Fosston
Sheedy, C. L. ..... Austin
Sheldon, W. D. ..... Rochester
Shelland, J. T. ..... Ada
Shellman, J. L. ..... St. Paul
Shelver, H. J. ..... Ortonville
Sheppard, Fred ..... Hutchinson
Sheppard, P. E. ..... Hutchinson
Sherman, C. H. ..... Bayport
Sherman, C. L. ..... Luverne
Sherwood, G. E. ..... Kimball
Shillington, M. A. ..... St. Paul
Short, Jacob ..... St. Paul
Shrader, J. S. ..... Springfield
Simison, C. W. ..... Hawley
Simon, B. F. ..... St. Paul
Simons, B. H. ..... Chaska
Simons, E. J. ..... Swanville
Simons, Jalmar ..... Minneapolis
Simpson, E. D. ..... Minneapolis
Simpson, J. D.* ..... Minneapolis
Sinamark, Andrew ..... Hibbing
Singer, B. I. ..... St. Paul
Siperstein, D. M. ..... Minneapolis
Sisler, C. E. ..... Grand Rapids
Sitar, R. F. ..... Minneapolis
Sivertsen, Ivar ..... Minneapolis
Skinner, H. O. ..... St. Paul
Slater, S. A. ..... Worthington
Slocumb, C. H. ..... Rochester
Slocumb, J. A. ..... Plainview
Slocumb, Maude S. ..... Minneapolis
Slyfield, F. F. ..... Duluth
Smallwood, J. T. ..... Worthington
Smersh, J. F. ..... Owatonna
Smith, A. E. ..... Minneapolis
Smith, A. M. ..... Thief River Falls
Smith, A. M. ..... Minneapolis
Smith, B. A. ..... Crosby
Smith, B. F. ..... Willmar
Smith, C. M. ..... Duluth
Smith, E. H. ..... Bemidji
Smith, E. K. ..... Duluth
Smith, F. L. ..... Rochester
Smith, Harry L. ..... Rochester
Smith, H. R. ..... Minneapolis
Smith, L. G. ..... Montevideo
Smith, M. W. ..... Red Wing
Smith, N. D. ..... Rochester
Smith, N. M. ..... Minneapolis
Smith, P. A. ..... Faribault
Smith, W. R. ..... Grand Marais
Snell, A. M. ..... Rochester
Snyder, G. W. ..... St. Paul
Soderlind, R. T. ..... Minneapolis
Sogge, L. ..... Windom
Sohlberg, Olof ..... St. Paul
Sohmer, A. E. ..... Mankato
Soine, T. S. ..... Barnesville
Solhaug, S. B. ..... Minneapolis
Sommer, A. W. ..... Elmore
Souster, B. B. ..... St. Paul
Spicer, F. W. ..... Duluth
Spooner, A. D. ..... Rochester
Sprafka, J. M. ..... St. Paul
Sprague, P. H. ..... Rochester
Spratt, C. N. ..... Minneapolis
Stacy, L. J. ..... Rochester
Stafne, W. A. ..... Rochester
Stangl, Fred ..... St. Cloud
Stanley, C. R. ..... Worthington
Stark, W. B. ..... Rochester
Starkey, T. A. ..... Rochester
St. Clair, G. G. ..... Duluth
Steffens, L. A. ..... Red Wing
Steinberg, C. L. ..... St. Paul
Steiner, I. W. ..... Winona
Stelter, Lloyd A. ..... Minneapolis
Stemsrud, A. A.* ..... Dawson
Stenstrom, Annette T. ..... Minneapolis
Stephan, E. L. ..... Hinckley
Stephenson, G. W. ..... Rochester
Sterner, E. G. ..... St. Paul
Sterner, O. W. ..... St. Paul
Stevens, F. A. ..... Lake Elmo
Stevens, George ..... Byron
Steward, J. A. ..... Rochester
Stewart, A. B. ..... Owatonna
Stewart, Alexander ..... St. Paul
Stewart, C. A. ..... Minneapolis
Stewart, Gwendolyn ..... Faribault
Stewart, R. I. ..... Minneapolis
Stickney, C. A. ..... St. Cloud
Stierle, Adolph, Jr. ..... St. Paul
Stiles, Angie G. ..... Northfield
Stillwell, W. C. ..... Mankato
Stinnette, S. E. ..... St. Paul
Stolpestad, H. L. ..... St. Paul
Stomel, Joseph ..... Minneapolis
Strachauer, A. C. ..... Minneapolis

*Deceased.

Strand, E. V. ..... Bayport
Strathern, F. P. ..... St. Peter
Strathern, M. L. ..... Gilbert
Stratte, A. K. ..... Pine City
Stratte, H. C. ..... Windom
Strobel, W. G. ..... Duluth
Strout, E. S. ..... Minneapolis
Stryker, W. B. ..... Plainview
Stuck, W. G. ..... Rochester
Stuhler, L. G. ..... Rochester
Stuhr, J. W. ..... Stillwater
Sturre, J. R. ..... Minneapolis
Stuurmanns, S. H. ..... Erskine
Sukeforth, L. A. ..... Duluth
Sundt, M. ..... Minneapolis
Sutherland, C. G. ..... Rochester
Sutherland, H. N. ..... Ely
Sutton, C. S. ..... St. Cloud
Sutton, L. F. ..... Mazeppa
Swanson, Cephas ..... Minneapolis
Swanson, E. O. ..... St. Paul
Swanson, J. A. ..... St. Paul
Swanson, R. E. ..... Minneapolis
Swart, H. A. ..... Rochester
Swedenburg, A. W. ..... Thief River Falls
Sweetman, R. H. ..... Sauk Center
Sweetser, H. B. ..... Minneapolis
Sweetser, H. B., Jr. ..... Minneapolis
Sweetser, Theodore ..... Minneapolis
Sweitzer, S. E. ..... Minneapolis
Swendseen, C. G. ..... Minneapolis
Swendson, J. J. ..... St. Paul
Swennes, O. S. ..... Wahkon
Swenson, A. O. ..... Duluth
Swenson, Charles ..... Braham
Swenson, O. J. ..... Waseca
Swezey, B. F. ..... Buffalo

Taft, J. O. ..... Minneapolis
Tangen, G. M. ..... Canby
Tanner, A. C. ..... Minneapolis
Tanquist, E. J. ..... Alexandria
Tavenner, L. J. ..... Waseca
Taylor, C. W. ..... Duluth
Taylor, H. L.* ..... St. Paul
Taylor, Rood ..... Minneapolis
Taylor, W. J. ..... Pipestone
Teisberg, C. B. ..... St. Paul
Telford, V. J. ..... Litchfield
Ternstrom, O. H. ..... Minneapolis
Thabes, J. A., Sr. ..... Brainerd
Thiessen, N. W. ..... Rochester
Thomas, G. E. ..... Minneapolis
Thomas, G. H. ..... Minneapolis
Thomas, G. J. ..... Minneapolis
Thompson, Albert ..... St. James
Thompson, Arthur ..... Raymond
Thompson, G. J. ..... Rochester
Thompson, H. H. ..... Minneapolis
Thompson, V. C. ..... Marine-on-St. Croix
Thordarson, Theo. ..... Minneota
Thornby, H. J. ..... Moorhead
Thornton, H. C. ..... Rochester
Thorsness, E. T. ..... Rochester
Thorson, E. O. ..... Luverne
Thorson, O. P. ..... Northfield
Thysell, F. A. ..... Moorhead
Tibbetts, M. H. ..... Duluth
Tierney, C. M. ..... Harmony
Tilderquist, D. L. ..... Duluth
Tingdale, A. C. ..... Minneapolis
Tofte, Josephine ..... Dawson
Tovell, R. M. ..... Rochester
Traeger, C. A. ..... Faribault
Traxler, F. J. ..... Henderson
Tregilgas, H. R. ..... South St. Paul
Trueman, H. S. ..... Minneapolis
Truog, C. P. ..... Lindstrom
Trutna, T. J. ..... Silver Lake
Turnbull, Robert ..... Fosston
Tunstead, H. J. ..... Minneapolis
Tuohy, E. L. ..... Duluth
Turnacliff, D. D. ..... Minneapolis
Tweedy, G. J. ..... Winona

Tyrrell, C. C. ..... Minneapolis
Tyvand, R. E. ..... Rochester

Ude, W. H. ..... Minneapolis
Ulrich, H. L. ..... Minneapolis
Undine, C. A. ..... Minneapolis
Urberg, S. E. ..... Duluth
Urner, J. A. ..... Minneapolis

Vaaler, T. ..... Cannon Falls
Vadheim, A. L. ..... Tyler
Vail, J. B. ..... Henning
Valentine, W. H. ..... Tracy
Van Meier, Henry ..... Stillwater
Van Slyke, C. A. ..... St. Paul
Van Valkenburg, B. F. ..... Long Prairie
Van Valkenburg, F. W. ..... Long Prairie
Vanzant, Frances R. ..... Rochester
Vaughan, V. M. ..... Truman
Veirs, Dean ..... St. Paul
Veirs, Ruby S. ..... St. Paul
Vercellini, C. E. ..... Duluth
Vezina, J. C. ..... Mapleton
Vik, A. E. ..... Minneapolis
Vik, Melvin ..... Onamia
Vinson, P. P. ..... Rochester
Vogel, J. H. ..... New Ulm
Vogtel, M. A. ..... Minneapolis
Voldenz, K. E. ..... Rochester
Von der Weyer, Wm. ..... St. Paul
Voris, H. C. ..... Rochester
Voyer, E. O. ..... Minneapolis
Vrooman, F. E. ..... St. Francis

Waas, C. W. ..... St. Paul
Wagener, H. P. ..... Rochester
Wahlquist, H. F. ..... Minneapolis
Wakefield, E. G. ..... Rochester
Waldron, C. W. ..... Minneapolis
Waldron, G. W. ..... Rochester
Walker, G. H. ..... Winona
Walker, M. A. ..... Rochester
Wall, C. R. ..... Minneapolis
Waller, J. D. ..... Wilmont
Waller, L. M. ..... Rochester
Walters, Waltman ..... Rochester
Wangensteen, O. H. ..... Minneapolis
Wanous, E. Z. ..... Minneapolis
Ward, A. W. ..... Minneapolis
Ward, P. A. ..... Minneapolis
Warham, T. T. ..... Minneapolis
Warnock, R. W. ..... St. Paul
Warren, E. L. ..... St. Paul
Warren, F. S. ..... Faribault
Watkins, C. H. ..... Rochester
Watson, F. G. ..... Worthington
Watson, J. A. ..... Minneapolis
Watson, J. D. ..... Holdingford
Watson, J. R. ..... Rochester
Watson, N. M. ..... Red Lake Falls
Watson, Sydney ..... Worthington
Wattam, G. S. ..... Warren
Webb, R. C. ..... Minneapolis
Webber, E. E. ..... Duluth
Webber, F. I. ..... St. Paul
Weber, H. M. ..... Rochester
Webster, W. W. ..... Rochester
Weir, J. F. ..... Rochester
Weiser, G. B. ..... New Ulm
Weisman, S. A. ..... Minneapolis
Welch, M. C. ..... St. Paul
Wellbrock, W. L. A. ..... Rochester
Wellcome, J. W. B. ..... Sleepy Eye
Welles, H. J. ..... Minneapolis
Welsh, A. L. ..... Rochester
Wenner, W. T. ..... St. Cloud
Wentworth, A. J. ..... Mankato
Werner, O. S. ..... Cambridge
West, E. J. ..... Duluth
Westby, Magnus ..... Madison
Westby, Nels ..... Madison
Westerman, A. E. ..... Montgomery
Westerman, F. C. ..... Montgomery
Wethal, A. G. ..... Minneapolis

Wetherby, Macnider ..... Minneapolis
Weum, T. W. ..... Minneapolis
Wheeler, D. W. ..... Duluth
Wheeler, M. W. ..... St. Paul
Whitacre, J. C. ..... St. Paul
Whitcomb, E. H. ..... St. Paul
White, J. S. ..... St. Paul
White, S. M. ..... Minneapolis
White, Willard D. ..... Minneapolis
Whitmore, Frank ..... St. Paul
Whitson, S. A. ..... Alden
Widen, W. F. ..... Minneapolis
Wieckman, F. H. ..... Sleepy Eye
Wiese, H. F. B. ..... Minneapolis
Wilbur, D. L. ..... Rochester
Wilcox, A. E. ..... Minneapolis
Wilder, R. L. ..... Minneapolis
Wilder, R. M. ..... Rochester
Wilken, P. A. ..... Minneapolis
Wilkerson, V. A. ..... Minneapolis
Wilkinsen, E. A. ..... Rochester
Wilkinson, Stella ..... Duluth
Will, W. W. ..... Bertha
Willcutt, Clarence ..... Minneapolis
Williams, A. B. ..... St. Paul
Williams, Clayton ..... St. Paul
Williams, H. L.* ..... Minneapolis
Williams, H. L., Jr. ..... Rochester
Williams, H. O. ..... Lake Crystal
Williams, L. A. ..... Slayton
Williams, M. R. ..... Cannon Falls
Williams, Robert ..... Minneapolis
Williams, R. V. ..... Rushford
Williamson, G. A. ..... St. Paul
Willius, F. A. ..... Rochester
Wilmot, H. E. ..... Litchfield
Wilson, C. E. ..... Blue Earth
Wilson, L. B. ..... Rochester
Wilson, R. H. ..... Winona
Wilson, Warren ..... Northfield
Wilson, W. E. ..... Northfield
Wilson, W. F. ..... Lake City
Wiltrout, I. G. ..... Oslo
Winnick, J. B. ..... St. Paul
Winter, J. A. ..... Duluth
Winther, Nora M. C. ..... Minneapolis
Witham, C. A. ..... Minneapolis
Withrow, M. E. ..... International Falls
Wittick, F. W. ..... Minneapolis
Wahlrabe, A. A. ..... Minneapolis
Wohlrabe, Clarence ..... Springfield
Wohlrabe, E. J. ..... Springfield
Wold, K. C. ..... St. Paul
Wolff, H. J. ..... Rochester
Wolner, O. H. ..... St. Peter
Woltman, H. W. ..... Rochester
Wood, D. F. ..... Minneapolis
Wood, H. G. ..... Rochester
Woodruff, C. W. ..... Chatfield
Woodworth, Elizabeth ..... Minneapolis
Woodworth, L. F. ..... Le Center
Workman, H. M. ..... Tracy
Workman, W. G. ..... Tracy
Wright, C. B. ..... Minneapolis
Wright, C. D. ..... Minneapolis
Wright, C. O. ..... Luverne
Wright, F. R. ..... Minneapolis
Wunder, H. E. ..... Shakopee
Wynne, H. M. N. ..... Minneapolis

Yaeger, W. W. ..... Ivanhoe
Ylvisaker, R. S. ..... Fergus Falls
Yoerg, O. W. ..... Minneapolis
Young, T. O. ..... Duluth
Young, V. A. ..... Duluth
Younger, L. I. ..... Winona

Zachman, A. H. ..... Melrose
Zanger, Isabelle M. ..... Minneapolis
Zaworski, E. A. ..... Minneapolis
Zeien, Thomas ..... North Branch
Zierold, A. A. ..... Minneapolis
Zimmermann, H. B. ..... St. Paul
Zinn, C. J. ..... Rochester

*Deceased.

LIST OF PHYSICIANS LICENSED BY THE MINNESOTA STATE BOARD OF MEDICAL EXAMINERS, MARCH 1, 1932.

BY EXAMINATION
(January)

NAME	SCHOOL AND DATE OF GRADUATION	ADDRESS
Albers, Edward Charles	U. of Pa., M.D., 1930	Mayo Clinic, Rochester, Minn.
Austin, Villairs Thomas	U. of Ore., M.D., 1929	Mayo Clinic, Rochester, Minn.
Andre, Hugo Carl	U. of Minn., M.B., 1931	3019 37th Ave. S., Minneapolis, Minn.
Baker, Abe Bert	U. of Minn., M.B., 1930; M.D., 1931	621 Oliver Ave. N., Minneapolis, Minn.
Beckman, Wallace Gerald	U. of Minn., M.B., 1931	Swedish Hospital, Minneapolis, Minn.
Biederman, Albert Alfred	U. of Minn., M.B., 1931	General Hospital, Minneapolis, Minn.
Blumstein, Alex	U. of Minn., M.B., 1930; M.D., 1931	335 St. Anthony Ave., St. Paul, Minn.
Cook, Norman Corrigan	U. of Man., Canada, M.D., 1930	Mayo Clinic, Rochester, Minn.
Danielson, Julia Hanson	Rush Med. Col., M.D., 1931	Litchfield, Minn.
Danielson, Lennox	Rush Med. Col., M.D., 1931	Litchfield, Minn.
Doroshow, George David	U. of Minn., M.B., 1931	1352 Goodrich Ave., St. Paul, Minn.
Faue, Clarence George	U. of Minn., M.B., 1931	1515 Charles St., St. Paul, Minn.
Freeman, Leonard, Jr.	U. of Colo., M.D., 1929	412 4th St. S. W., Rochester, Minn.
Garvin, Robert Odell	U. of Pittsburgh, M.D., 1929	Mayo Clinic, Rochester, Minn.
Ghiselin, Alex. Dickinson, Jr.	Columbia Univ., M.D., 1929	Mayo Clinic, Rochester, Minn.
Goodwin, Thomas Wright	U. of Georgia, M.D., 1930	Mayo Clinic, Rochester, Minn.
Hottinger, Raymond Creighton	Creighton Univ., M.D., 1930	Janesville, Minn.
Kettlewell, Ralph Burnsell	U. of Minn., M.B., 1931	2525 Garfield Ave. S., Minneapolis, Minn.
Keyes, Howard Craig	U. of Buffalo, M.D., 1928	Mayo Clinic, Rochester, Minn.
Kirch, Walter	Royal Univ. of Florence, Italy Diploma of Doctorate, 1925	Mayo Clinic, Rochester, Minn.
Kugler, Alex. A	U. of Minn., M.B., 1931	General Hospital, Minneapolis, Minn.
Lansbury, John	Queen's Univ., Canada, M.D., 1926	Mayo Clinic, Rochester, Minn.
Martin, Melvin Sylvester	U. of Minn., M.B., 1930; M.D., 1931	Sedan, Minn.
McDonald, Angus Morris, Jr.	U. of Pa., M.D., 1928	Mayo Clinic, Rochester, Minn.
Mork, Byron O., Jr.	U. of Minn., M.B., 1930; M.D., 1931	Worthington, Minn.
Ouellette, Alfred Joseph	Loyola Univ., M.D., 1931	707 Fullerton Pkwy., Chicago, Ill.
Parkhill, Edith Muriel	U. of Wis., M.D., 1930	624 4th St. S. W., Rochester, Minn.
Parker, Wilbert Howard	U. of Wis., M.D., 1930	Eypta, Minn.
Purves, George Harland	U. of Minn., M.B., 1931	St. Mary's Hospital, Duluth, Minn.
Raaf, John Elbert	Stanford Univ., M.D., 1930	Mayo Clinic, Rochester, Minn.
Robertson, Murl John	U. of Minn., M.B., 1930; M.D., 1931	Bayfield, Wis.
Rogers, Sydney Francis	U. of Minn., M.B., 1931	906 E. 6th St., St. Paul, Minn.
Rosenthal, Nāna Lu	Col. of Med. Evang., M.D., 1931	800 W. Winona St., Austin, Minn.
Rosenthal, Frank Harold	Col. of Med. Evang., M.D., 1931	800 W. Winona St., Austin, Minn.
Rudolph, Edward August	U. of Mich., M.D., 1931	Mayo Clinic, Rochester, Minn.
Schamber, Dean	U. of Minn., M.B., 1931	513 Summit Ave., St. Paul, Minn.
Sisk, Harvey Ernest	U. of Minn., M.B., 1931	Mazeppa, Minn.
Stafford, Charles Eugene	U. of Minn., M.B., 1930; M.D., 1931	Kensington, Minn.
Thorp, Edward George	Harvard U., M.D., 1929	603 1st St. S. W., Rochester, Minn.
Van Hale, Laurence Aloys	U. of Minn., M.B., 1931	951 14th Ave. S. E., Minneapolis, Minn.
Van Slyke, Cassius James	U. of Minn., M.B., 1927; M.D., 1928	3925 Pillsbury Ave., Minneapolis, Minn.
Watz, Clarence Emanuel	U. of Minn., M.B., 1931	Ancker Hospital, St. Paul, Minn.
Wood, George Thomas, Jr.	Jefferson Med. Col., M.D., 1928	Mayo Clinic, Rochester, Minn.

BY RECIPROCITY

Clark, Anson Luman	Rush Med. Col., M.D., 1929	Mayo Clinic, Rochester, Minn.
Lovett, Beatrice Russell	Rush Med. Col., M.D., 1924	Oak Terrace, Minn.
Powers, Kenneth Vernon	Northwestern U., M.D., 1930	Rood Hospital, Hibbing, Minn.
Rydell, Otto Ellwood	U. of Wis., M.D., 1928	2129 John Ave., Superior, Wis.

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Gronewald, Tula Wilhelmina	Woman's Med. Col. of Pa., M.D., 1929	Fergus Falls, Minn.